

# *Annual Final Report*

## *AFR*

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### **CV-Helios Network Annual Final Report for 2009**

In the year 2009, Solar Cycle no. 24

The Average CV was: 2,5 and the Average 6-rot. Smoothed CV was: 1,7

The Average CV-USAF was: 6,2

giving an Estimated STDEV of: 4,0

CV-Helios Network observed on 365 days

CV-Helios Network had a total of 9121 observations in 2009

CV-Helios Network have received 517 observation entries in the year 2009

CV-Helios Network's observers had an average of 15,5 observations per day

This Annual Final Report contain results from 48 CV-observers

A sincere thanks to all observers for their fine contributions in the passed year.

CV-Helios Network 01. April 2010



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Kjell Inge Malde  
Director

**CV-Helios Network Annual Final Report for 2009**

| <b>Individual results for the year 2009</b> |                                |                |            |             |              |           |
|---|--------------------------------|----------------|------------|-------------|--------------|-----------|
| CV-   | Name                           | Country        | CV         | Obs         | K            | Obs. Tot. |
| CV-001                                      | MALDE, KJELL INGE              | NORWAY         | 3,3        | 255         | 1,578        | 6080      |
| CV-010                                      | DUBOIS, FRANKY                 | BELGIUM        | 2,8        | 305         | 0,994        | 5762      |
| CV-019                                      | JUNKER, ELMAR                  | GERMANY        | 2,6        | 141         | 0,740        | 2322      |
| CV-020                                      | HOLL, MANFRED                  | GERMANY        | 2,1        | 223         | 0,712        | 3285      |
| CV-021                                      | BARNES, HOWARD                 | NEW ZEALAND    | 3,5        | 138         | 0,766        | 3088      |
| CV-022                                      | VIERTEL, ANDREAS               | GERMANY        | 2,5        | 189         | 0,631        | 3677      |
| CV-023                                      | BRETSCHNEIDER, HARTMUT         | GERMANY        | 1,3        | 195         | 1,459        | 2994      |
| CV-033                                      | SZULC, MIECZYSLAW              | POLAND         | 3,1        | 169         | 0,900        | 1566      |
| CV-034                                      | VVS BELGIUM,                   | BELGIUM        | 2,5        | 340         | 1,079        | 3532      |
| CV-038                                      | MORALES, GERMAN                | BOLIVIA        | 3,3        | 321         | 1,811        | 3856      |
| CV-040                                      | BATTAIOLA, ROBERTO             | ITALY          | 2,8        | 70          | 2,500        | 1391      |
| CV-044                                      | SCHRÖDER, GERD                 | GERMANY        | 2,9        | 199         | 0,634        | 2294      |
| CV-049                                      | MARTIN-SMITH, MICHAEL          | UNITED KINGDOM | 0,4        | 45          | 0,096        | 369       |
| CV-068                                      | THIMM, SVEN OVE                | DENMARK        | 1,9        | 168         | 0,369        | 2221      |
| CV-076                                      | LOADER, PAULINE                | NEW ZEALAND    | 5,2        | 74          | 0,994        | 899       |
| CV-077                                      | JOHNSTON, ANDREW               | UNITED KINGDOM | 2,0        | 186         | 0,527        | 1304      |
| CV-080                                      | JANSSENS, JAN                  | BELGIUM        | 2,0        | 79          | 1,222        | 433       |
| CV-082                                      | URBANSKI, PIOTR                | POLAND         | 2,3        | 240         | 0,879        | 2341      |
| CV-086                                      | TOS-POLAND                     | POLAND         | 3,2        | 365         | 1,283        | 3705      |
| CV-091                                      | DALEK, GRZEGORZ                | POLAND         | 1,9        | 169         | 0,536        | 1997      |
| CV-095                                      | ANDRESEN, BIRGER               | NORWAY         | 2,2        | 124         | 0,785        | 1167      |
| CV-102                                      | MOSEY, PAULO ROBERTO           | BRAZIL         | 2,2        | 87          | 0,425        | 1138      |
| CV-103                                      | STEEN, OCTAAF                  | BELGIUM        | 2,8        | 314         | 0,954        | 2270      |
| CV-104                                      | MEEUS, LIEVE                   | BELGIUM        | 1,8        | 200         | 0,965        | 1477      |
| CV-105                                      | RYBACK, ALEXEY                 | RUSSIA         | 3,2        | 162         | 1,029        | 1644      |
| CV-107                                      | LEVENTHAL, MONTY               | AUSTRALIA      | 3,2        | 256         | 1,055        | 2178      |
| CV-116                                      | BJERKGAARD, TERJE              | NORWAY         | 1,6        | 37          | 3,612        | 363       |
| CV-122                                      | FEIK, VLASTISLAV               | CZECH REPUBLIC | 2,1        | 187         | 1,036        | 1371      |
| CV-130                                      | VARGAS, LUCIMARY               | BRAZIL         | 3,5        | 92          | 0,735        | 322       |
| CV-135                                      | ARAUJO, GEMA                   | SPAIN          | 2,6        | 352         | 1,133        | 2634      |
| CV-136                                      | GARCÍA, FAUSTINO               | SPAIN          | 2,2        | 189         | 1,109        | 1454      |
| CV-139                                      | ALONSO, JAVIER                 | SPAIN          | 2,2        | 246         | 0,977        | 1161      |
| CV-146                                      | GONZÁLEZ COROAS, ANGEL ALBERTO | CUBA           | 1,6        | 365         | 0,336        | 2219      |
| CV-151                                      | CARELS, JEFFREY                | BELGIUM        | 2,3        | 266         | 0,783        | 872       |
| CV-153                                      | JASKULSKA, KRYSZYNA            | POLAND         | 1,5        | 177         | 0,856        | 375       |
| CV-157                                      | BUCK, ALAN                     | UNITED KINGDOM | 2,7        | 300         | 1,096        | 1142      |
| CV-166                                      | DUFOER, SJOERD                 | BELGIUM        | 3,7        | 125         | 2,345        | 397       |
| CV-168                                      | SCHOTT, GERD LUTZ              | GERMANY        | 1,6        | 267         | 0,317        | 697       |
| CV-171                                      | MALUF, WALTER JOSE             | BRAZIL         | 2,5        | 150         | 0,511        | 376       |
| CV-172                                      | LLENAS GARCIA, JOSE Mº         | SPAIN          | 2,5        | 154         | 2,258        | 277       |
| CV-176                                      | GUBBELS, GUIDO                 | BELGIUM        | 3,0        | 202         | 1,521        | 506       |
| CV-177                                      | BACKER, HENDRIK DE             | BELGIUM        | 3,0        | 260         | 1,112        | 574       |
| CV-178                                      | MARIUZZA, FABIO                | ITALY          | 2,9        | 254         | 1,231        | 493       |
| CV-181                                      | DERZIKOWSKI, ADAM              | POLAND         | 0,4        | 54          | 0,642        | 220       |
| CV-183                                      | WIRKUS, PIOTR                  | POLAND         | 1,1        | 103         | 0,695        | 136       |
| CV-186                                      | DEKELVER, PIETER-JAN           | BELGIUM        | 2,7        | 188         | 1,248        | 210       |
| CV-189                                      | HESSCHE, DIRK VAN              | BELGIUM        | 5,8        | 37          | 1,078        | 37        |
| CV-190                                      | VERBOVEN, RUBEN                | BELGIUM        | 3,5        | 102         | 1,173        | 102       |
|   |                                |                |            |             |              |           |
|   |                                |                |            |             |              |           |
|   |                                |                |            |             |              |           |
|   |                                |                |            |             |              |           |
|   | <b>49</b>                      |                | <b>2,5</b> | <b>9121</b> | <b>1,057</b> |           |

## CV-Helios Network Annual Final Report for 2009

| Collated results CV for the year 2009 |             |             |             |             |             |             |             |             |             |             |             |              |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| CV                                    | Jan         | Feb         | Mar         | Apr         | May         | Jun         | Jul         | Aug         | Sep         | Oct         | Nov         | Dec          |
| 1                                     | 0,00        | 0,00        | 0,44        | 0,00        | 0,06        | 11,43       | 0,50        | 0,00        | 1,42        | 0,43        | 0,00        | 0,00         |
| 2                                     | 0,00        | 0,00        | 0,00        | 0,00        | 0,00        | 15,55       | 0,00        | 0,00        | 0,06        | 0,00        | 0,00        | 0,00         |
| 3                                     | 0,00        | 0,00        | 0,00        | 0,00        | 0,00        | 9,81        | 2,90        | 0,03        | 0,00        | 0,00        | 0,00        | 0,00         |
| 4                                     | 0,00        | 0,00        | 0,00        | 0,10        | 0,24        | 6,45        | 22,91       | 0,00        | 0,00        | 0,15        | 0,47        | 0,00         |
| 5                                     | 0,10        | 0,00        | 0,00        | 0,00        | 0,00        | 1,14        | 26,68       | 0,00        | 0,00        | 0,00        | 1,24        | 0,00         |
| 6                                     | 1,19        | 0,00        | 1,63        | 0,28        | 0,00        | 0,00        | 25,97       | 0,03        | 0,00        | 0,00        | 2,94        | 0,00         |
| 7                                     | 0,22        | 0,00        | 0,92        | 0,00        | 0,00        | 0,04        | 23,27       | 0,00        | 0,00        | 0,00        | 0,05        | 0,00         |
| 8                                     | 0,00        | 0,00        | 0,07        | 0,00        | 0,00        | 0,56        | 28,27       | 0,00        | 0,06        | 0,00        | 0,09        | 0,00         |
| 9                                     | 2,97        | 0,00        | 0,07        | 0,00        | 0,00        | 0,81        | 20,90       | 0,00        | 0,00        | 0,00        | 5,88        | 0,88         |
| 10                                    | 8,64        | 0,00        | 0,11        | 0,00        | 0,03        | 0,12        | 19,22       | 0,00        | 0,00        | 0,25        | 3,96        | 2,41         |
| 11                                    | 7,53        | 0,71        | 0,08        | 0,00        | 0,10        | 0,00        | 0,00        | 0,00        | 0,00        | 0,20        | 0,71        | 3,39         |
| 12                                    | 1,11        | 0,73        | 0,13        | 0,00        | 0,19        | 0,12        | 0,00        | 0,00        | 0,00        | 0,00        | 0,05        | 2,66         |
| 13                                    | 0,14        | 0,24        | 0,09        | 0,00        | 0,69        | 0,00        | 0,00        | 0,03        | 0,00        | 0,07        | 0,68        | 2,43         |
| 14                                    | 0,00        | 0,00        | 0,33        | 0,00        | 2,09        | 0,05        | 0,00        | 0,00        | 0,00        | 0,00        | 0,27        | 14,69        |
| 15                                    | 0,00        | 0,00        | 0,00        | 0,00        | 2,13        | 0,00        | 0,00        | 0,03        | 0,00        | 0,00        | 0,66        | 22,54        |
| 16                                    | 0,00        | 0,00        | 0,00        | 0,00        | 1,92        | 0,04        | 0,00        | 0,00        | 0,00        | 0,00        | 1,06        | 28,35        |
| 17                                    | 0,00        | 0,00        | 0,00        | 0,00        | 0,94        | 0,42        | 0,00        | 0,00        | 0,11        | 0,64        | 0,29        | 27,69        |
| 18                                    | 0,13        | 0,00        | 0,00        | 0,00        | 1,50        | 0,00        | 0,00        | 0,00        | 0,06        | 0,15        | 2,55        | 33,52        |
| 19                                    | 0,47        | 0,00        | 0,00        | 0,00        | 0,63        | 0,04        | 0,00        | 0,00        | 0,17        | 0,05        | 3,27        | 30,12        |
| 20                                    | 0,10        | 0,00        | 0,00        | 0,00        | 0,26        | 0,00        | 0,00        | 0,00        | 0,00        | 0,28        | 3,41        | 41,92        |
| 21                                    | 0,00        | 0,00        | 0,00        | 0,85        | 0,03        | 0,51        | 0,00        | 0,00        | 4,83        | 2,00        | 2,59        | 37,24        |
| 22                                    | 0,00        | 0,00        | 0,17        | 0,25        | 0,80        | 5,41        | 0,07        | 0,00        | 13,67       | 0,00        | 1,02        | 16,72        |
| 23                                    | 0,00        | 0,00        | 0,00        | 0,00        | 1,33        | 6,90        | 0,55        | 0,00        | 27,19       | 4,90        | 0,58        | 7,94         |
| 24                                    | 0,00        | 2,81        | 0,00        | 0,00        | 0,00        | 7,33        | 0,04        | 0,00        | 26,10       | 12,23       | 0,00        | 0,79         |
| 25                                    | 0,00        | 1,45        | 0,00        | 0,00        | 0,00        | 0,73        | 0,00        | 0,00        | 20,25       | 17,48       | 0,00        | 0,00         |
| 26                                    | 0,00        | 0,42        | 0,35        | 0,00        | 0,00        | 0,04        | 0,00        | 0,00        | 13,60       | 21,21       | 0,00        | 3,34         |
| 27                                    | 0,23        | 0,00        | 0,00        | 0,00        | 0,00        | 0,00        | 0,00        | 0,00        | 3,94        | 27,74       | 0,00        | 10,59        |
| 28                                    | 0,00        | 0,00        | 0,00        | 0,18        | 0,00        | 0,00        | 0,00        | 0,00        | 8,58        | 30,22       | 0,00        | 23,78        |
| 29                                    | 0,28        |             | 0,00        | 2,24        | 0,00        | 0,00        | 0,00        | 0,00        | 4,19        | 26,90       | 0,00        | 20,00        |
| 30                                    | 0,00        |             | 0,00        | 0,85        | 0,17        | 0,00        | 0,33        | 0,00        | 1,42        | 21,67       | 0,00        | 16,00        |
| 31                                    | 0,00        |             | 0,00        |             | 1,85        |             | 0,85        | 0,68        |             | 0,00        |             | 22,27        |
| <b>2,75</b>                           | <b>0,75</b> | <b>0,23</b> | <b>0,14</b> | <b>0,16</b> | <b>0,48</b> | <b>2,25</b> | <b>5,56</b> | <b>0,03</b> | <b>4,19</b> | <b>5,37</b> | <b>1,06</b> | <b>11,91</b> |

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| Collated results Observers for the year 2009 |              |              |              |              |              |              |              |              |              |              |              |              |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Obsrvrs.                                     | Jan          | Feb          | Mar          | Apr          | May          | Jun          | Jul          | Aug          | Sep          | Oct          | Nov          | Dec          |
| 1  | 13           | 25           | 25           | 28           | 35           | 35           | 32           | 40           | 31           | 21           | 22           | 13           |
| 2  | 13           | 10           | 22           | 32           | 32           | 33           | 32           | 32           | 31           | 23           | 24           | 10           |
| 3  | 27           | 19           | 17           | 31           | 32           | 32           | 29           | 29           | 30           | 20           | 21           | 17           |
| 4  | 20           | 16           | 21           | 29           | 25           | 33           | 33           | 34           | 28           | 27           | 19           | 17           |
| 5  | 20           | 22           | 16           | 29           | 20           | 28           | 31           | 36           | 32           | 15           | 17           | 19           |
| 6  | 21           | 22           | 19           | 25           | 22           | 23           | 30           | 37           | 29           | 16           | 20           | 16           |
| 7  | 15           | 20           | 25           | 25           | 35           | 28           | 30           | 36           | 34           | 19           | 20           | 20           |
| 8  | 21           | 19           | 28           | 28           | 33           | 25           | 22           | 31           | 32           | 24           | 23           | 16           |
| 9  | 19           | 13           | 28           | 26           | 31           | 27           | 31           | 31           | 26           | 28           | 14           | 16           |
| 10   | 30           | 10           | 18           | 29           | 33           | 26           | 23           | 32           | 29           | 20           | 18           | 17           |
| 11   | 31           | 14           | 25           | 30           | 29           | 31           | 24           | 32           | 31           | 15           | 17           | 16           |
| 12   | 21           | 22           | 16           | 26           | 26           | 33           | 29           | 32           | 26           | 25           | 20           | 22           |
| 13   | 21           | 17           | 22           | 30           | 32           | 29           | 32           | 35           | 28           | 28           | 24           | 22           |
| 14   | 12           | 21           | 27           | 33           | 33           | 22           | 29           | 36           | 26           | 27           | 23           | 19           |
| 15   | 19           | 27           | 25           | 27           | 24           | 25           | 27           | 36           | 27           | 21           | 22           | 26           |
| 16   | 10           | 20           | 19           | 22           | 26           | 28           | 30           | 37           | 25           | 23           | 16           | 17           |
| 17   | 20           | 16           | 28           | 20           | 33           | 33           | 28           | 36           | 28           | 28           | 14           | 16           |
| 18   | 16           | 20           | 29           | 28           | 30           | 33           | 24           | 37           | 31           | 27           | 20           | 23           |
| 19   | 19           | 24           | 27           | 34           | 32           | 24           | 28           | 39           | 29           | 21           | 20           | 24           |
| 20   | 20           | 23           | 27           | 32           | 35           | 29           | 30           | 33           | 32           | 25           | 21           | 24           |
| 21   | 16           | 25           | 32           | 33           | 32           | 35           | 28           | 32           | 30           | 19           | 27           | 17           |
| 22   | 11           | 18           | 29           | 28           | 35           | 29           | 29           | 32           | 30           | 16           | 20           | 18           |
| 23   | 13           | 16           | 19           | 28           | 36           | 29           | 22           | 35           | 27           | 20           | 12           | 18           |
| 24   | 25           | 16           | 27           | 29           | 32           | 24           | 26           | 30           | 31           | 13           | 11           | 14           |
| 25   | 30           | 22           | 24           | 32           | 31           | 26           | 27           | 33           | 28           | 29           | 16           | 14           |
| 26   | 20           | 19           | 23           | 26           | 29           | 24           | 28           | 34           | 35           | 14           | 19           | 23           |
| 27   | 13           | 18           | 24           | 20           | 28           | 25           | 31           | 37           | 35           | 19           | 20           | 17           |
| 28   | 14           | 26           | 29           | 22           | 24           | 26           | 30           | 34           | 24           | 23           | 20           | 20           |
| 29   | 20           |              | 28           | 25           | 29           | 27           | 31           | 36           | 21           | 21           | 16           | 14           |
| 30   | 18           |              | 24           | 27           | 30           | 34           | 30           | 35           | 24           | 24           | 19           | 8            |
| 31   | 26           |              | 26           |              | 33           |              | 26           | 37           |              | 23           |              | 11           |
| <b>24,93</b>                                 | <b>19,16</b> | <b>19,29</b> | <b>24,16</b> | <b>27,80</b> | <b>30,23</b> | <b>28,53</b> | <b>28,45</b> | <b>34,39</b> | <b>29,00</b> | <b>21,74</b> | <b>19,17</b> | <b>17,55</b> |

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| Collated results CV-USAF for the year 2009 |             |             |             |             |             |             |              |     |             |              |             |              |
|--|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-----|-------------|--------------|-------------|--------------|
| USAF-CV                                    | Jan         | Feb         | Mar         | Apr         | May         | Jun         | Jul          | Aug | Sep         | Oct          | Nov         | Dec          |
| 1  |             |             |             |             |             | 5,05        |              |     | 0,09        |              |             |              |
| 2  |             |             |             |             |             | 7,74        |              |     |             |              |             |              |
| 3  |             |             |             |             |             | 4,06        | 0,56         |     |             |              |             |              |
| 4  |             |             |             |             |             | 2,18        | 13,01        |     |             |              |             |              |
| 5  |             |             |             |             |             | 0,03        | 15,89        |     |             |              | 0,05        |              |
| 6  | 0,04        |             | 0,14        |             |             |             | 15,34        |     |             |              | 0,58        |              |
| 7  |             |             |             |             |             |             | 13,28        |     |             |              |             |              |
| 8  |             |             |             |             |             |             | 17,14        |     |             |              |             |              |
| 9  | 0,59        |             |             |             |             |             | 11,53        |     |             |              | 1,89        |              |
| 10   | 3,38        |             |             |             |             |             | 10,30        |     |             |              | 0,99        | 0,39         |
| 11   | 2,76        |             |             |             |             |             |              |     |             |              |             | 0,75         |
| 12   | 0,02        |             |             |             |             |             |              |     |             |              |             | 0,47         |
| 13   |             |             |             |             |             |             |              |     |             |              |             | 0,39         |
| 14   |             |             |             |             | 0,28        |             |              |     |             |              |             | 7,16         |
| 15   |             |             |             |             | 0,29        |             |              |     |             |              |             | 12,74        |
| 16   |             |             |             |             | 0,23        |             |              |     |             |              | 0,01        | 17,20        |
| 17   |             |             |             |             |             |             |              |     |             |              |             | 16,68        |
| 18   |             |             |             |             | 0,11        |             |              |     |             |              | 0,43        | 21,35        |
| 19   |             |             |             |             |             |             |              |     |             |              | 0,70        | 18,60        |
| 20   |             |             |             |             |             |             |              |     |             |              | 0,76        | 28,40        |
| 21   |             |             |             |             |             |             |              |     | 1,38        | 0,25         | 0,45        | 24,43        |
| 22   |             |             |             |             |             | 1,66        |              |     | 6,48        |              | 0,00        | 8,54         |
| 23   |             |             |             |             | 0,07        | 2,42        |              |     | 16,28       | 1,41         |             | 2,99         |
| 24   |             | 0,53        |             |             |             | 2,65        |              |     | 15,44       | 5,55         |             |              |
| 25   |             | 0,10        |             |             |             |             |              |     | 11,05       | 9,07         |             |              |
| 26   |             |             |             |             |             |             |              |     | 6,44        | 11,75        |             | 0,73         |
| 27   |             |             |             |             |             |             |              |     | 0,98        | 16,72        |             | 4,53         |
| 28   |             |             |             |             |             |             |              |     | 3,35        | 18,68        |             | 13,67        |
| 29   |             |             |             | 0,33        |             |             |              |     | 1,09        | 16,07        |             | 10,87        |
| 30   |             |             |             |             |             |             |              |     | 0,09        | 12,09        |             | 8,05         |
| 31   |             |             |             |             | 0,21        |             |              |     |             |              |             | 12,54        |
| <b>6,02</b>                                | <b>1,36</b> | <b>0,31</b> | <b>0,14</b> | <b>0,33</b> | <b>0,20</b> | <b>3,22</b> | <b>12,13</b> |     | <b>5,70</b> | <b>10,18</b> | <b>0,59</b> | <b>10,52</b> |

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| Collated results STDEV for the year 2009 |             |             |             |             |             |             |             |     |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----|-------------|-------------|-------------|-------------|
| std. Dev.                                | Jan         | Feb         | Mar         | Apr         | May         | Jun         | Jul         | Aug | Sep         | Oct         | Nov         | Dec         |
| 1  |             |             |             |             |             | 4,51        |             |     | 0,94        |             |             |             |
| 2  |             |             |             |             |             | 5,52        |             |     |             |             |             |             |
| 3  |             |             |             |             |             | 4,06        | 1,65        |     |             |             |             |             |
| 4  |             |             |             |             |             | 3,02        | 7,00        |     |             |             |             |             |
| 5  |             |             |             |             |             | 0,79        | 7,63        |     |             |             | 0,84        |             |
| 6  | 0,82        |             | 1,05        |             |             |             | 7,52        |     |             |             | 1,67        |             |
| 7  |             |             |             |             |             |             | 7,06        |     |             |             |             |             |
| 8  |             |             |             |             |             |             | 7,87        |     |             |             |             |             |
| 9  | 1,69        |             |             |             |             |             | 6,63        |     |             |             | 2,82        |             |
| 10                                       | 3,72        |             |             |             |             |             | 6,30        |     |             |             | 2,10        | 1,43        |
| 11                                       | 3,37        |             |             |             |             |             |             |     |             |             |             | 1,87        |
| 12                                       | 0,77        |             |             |             |             |             |             |     |             |             |             | 1,55        |
| 13                                       |             |             |             |             |             |             |             |     |             |             |             | 1,44        |
| 14                                       |             |             |             |             | 1,28        |             |             |     |             |             |             | 5,32        |
| 15                                       |             |             |             |             | 1,30        |             |             |     |             |             |             | 6,93        |
| 16                                       |             |             |             |             | 1,20        |             |             |     |             |             | 0,74        | 7,89        |
| 17                                       |             |             |             |             |             |             |             |     |             |             |             | 7,79        |
| 18                                       |             |             |             |             | 0,98        |             |             |     |             |             | 1,50        | 8,60        |
| 19                                       |             |             |             |             |             |             |             |     |             |             | 1,82        | 8,14        |
| 20                                       |             |             |             |             |             |             |             |     |             |             | 1,88        | 9,56        |
| 21                                       |             |             |             |             |             |             |             |     | 2,44        | 1,24        | 1,52        | 9,06        |
| 22                                       |             |             |             |             |             | 2,66        |             |     | 5,08        |             | 0,72        | 5,78        |
| 23                                       |             |             |             |             | 0,89        | 3,17        |             |     | 7,71        | 2,47        |             | 3,51        |
| 24                                       |             | 1,62        |             |             |             | 3,31        |             |     | 7,54        | 4,72        |             |             |
| 25                                       |             | 0,96        |             |             |             |             |             |     | 6,51        | 5,95        |             |             |
| 26                                       |             |             |             |             |             |             |             |     | 5,06        | 6,69        |             | 1,85        |
| 27                                       |             |             |             |             |             |             |             |     | 2,09        | 7,79        |             | 4,28        |
| 28                                       |             |             |             |             |             |             |             |     | 3,70        | 8,16        |             | 7,15        |
| 29                                       |             |             |             | 1,35        |             |             |             |     | 2,19        | 7,66        |             | 6,46        |
| 30                                       |             |             |             |             |             |             |             |     | 0,94        | 6,77        |             | 5,62        |
| 31                                       |             |             |             |             | 1,16        |             |             |     |             |             |             | 6,88        |
| <b>3,90</b>                              | <b>2,07</b> | <b>1,29</b> | <b>1,05</b> | <b>1,35</b> | <b>1,14</b> | <b>3,38</b> | <b>6,46</b> |     | <b>4,02</b> | <b>5,72</b> | <b>1,56</b> | <b>5,56</b> |

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| Collated results CV 6 rot. averages for the year 2009 |             |             |             |             |             |             |             |             |             |             |             |             |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CV-6 rot.   | Jan         | Feb         | Mar         | Apr         | May         | Jun         | Jul         | Aug         | Sep         | Oct         | Nov         | Dec         |
| 1   | 1,30        | 1,43        | 1,47        | 1,16        | 0,36        | 0,40        | 0,61        | 1,64        | 1,60        | 2,35        | 3,28        | 3,16        |
| 2   | 1,30        | 1,43        | 1,47        | 1,16        | 0,36        | 0,49        | 0,60        | 1,64        | 1,60        | 2,35        | 3,27        | 3,16        |
| 3   | 1,30        | 1,43        | 1,46        | 1,16        | 0,36        | 0,55        | 0,62        | 1,64        | 1,60        | 2,35        | 3,26        | 3,12        |
| 4   | 1,30        | 1,43        | 1,46        | 1,16        | 0,37        | 0,59        | 0,76        | 1,64        | 1,60        | 2,35        | 3,26        | 3,08        |
| 5   | 1,30        | 1,43        | 1,42        | 1,16        | 0,37        | 0,60        | 0,92        | 1,64        | 1,60        | 2,35        | 3,27        | 3,04        |
| 6   | 1,30        | 1,43        | 1,42        | 1,16        | 0,37        | 0,60        | 1,08        | 1,64        | 1,60        | 2,35        | 3,29        | 3,03        |
| 7   | 1,31        | 1,43        | 1,42        | 1,16        | 0,37        | 0,60        | 1,22        | 1,62        | 1,60        | 2,35        | 3,29        | 3,03        |
| 8   | 1,31        | 1,43        | 1,42        | 1,16        | 0,37        | 0,60        | 1,40        | 1,61        | 1,60        | 2,35        | 3,29        | 3,03        |
| 9   | 1,32        | 1,43        | 1,42        | 1,16        | 0,37        | 0,61        | 1,52        | 1,61        | 1,60        | 2,35        | 3,33        | 3,04        |
| 10  | 1,38        | 1,43        | 1,42        | 1,16        | 0,37        | 0,61        | 1,64        | 1,61        | 1,60        | 2,34        | 3,35        | 3,05        |
| 11  | 1,42        | 1,43        | 1,42        | 1,16        | 0,37        | 0,61        | 1,64        | 1,61        | 1,60        | 2,33        | 3,34        | 3,07        |
| 12  | 1,43        | 1,44        | 1,42        | 1,16        | 0,37        | 0,61        | 1,64        | 1,61        | 1,60        | 2,33        | 3,27        | 3,09        |
| 13  | 1,43        | 1,44        | 1,42        | 1,14        | 0,37        | 0,61        | 1,64        | 1,61        | 1,60        | 2,33        | 3,18        | 3,10        |
| 14  | 1,43        | 1,44        | 1,42        | 1,13        | 0,38        | 0,61        | 1,64        | 1,61        | 1,60        | 2,33        | 3,13        | 3,17        |
| 15  | 1,43        | 1,44        | 1,42        | 1,04        | 0,40        | 0,61        | 1,64        | 1,61        | 1,60        | 2,33        | 3,09        | 3,17        |
| 16  | 1,43        | 1,44        | 1,42        | 0,93        | 0,41        | 0,61        | 1,64        | 1,61        | 1,60        | 2,33        | 3,09        | 3,18        |
| 17  | 1,43        | 1,44        | 1,42        | 0,86        | 0,41        | 0,61        | 1,64        | 1,60        | 1,60        | 2,33        | 3,09        | 3,19        |
| 18  | 1,43        | 1,44        | 1,42        | 0,82        | 0,42        | 0,61        | 1,64        | 1,59        | 1,60        | 2,34        | 3,11        | 3,25        |
| 19  | 1,43        | 1,44        | 1,42        | 0,78        | 0,43        | 0,60        | 1,64        | 1,59        | 1,60        | 2,34        | 3,12        | 3,26        |
| 20  | 1,43        | 1,44        | 1,42        | 0,78        | 0,43        | 0,60        | 1,64        | 1,59        | 1,60        | 2,34        | 3,14        | 3,39        |
| 21  | 1,43        | 1,44        | 1,42        | 0,79        | 0,43        | 0,60        | 1,64        | 1,59        | 1,63        | 2,35        | 3,15        | 3,50        |
| 22  | 1,43        | 1,44        | 1,42        | 0,79        | 0,43        | 0,62        | 1,64        | 1,59        | 1,71        | 2,35        | 3,16        | 3,60        |
| 23  | 1,43        | 1,44        | 1,41        | 0,76        | 0,40        | 0,61        | 1,64        | 1,59        | 1,88        | 2,38        | 3,16        | 3,65        |
| 24  | 1,43        | 1,45        | 1,35        | 0,63        | 0,34        | 0,61        | 1,64        | 1,59        | 2,03        | 2,45        | 3,16        | 3,66        |
| 25  | 1,43        | 1,46        | 1,29        | 0,50        | 0,31        | 0,61        | 1,64        | 1,59        | 2,16        | 2,54        | 3,16        | 3,66        |
| 26  | 1,43        | 1,46        | 1,25        | 0,44        | 0,31        | 0,60        | 1,63        | 1,59        | 2,24        | 2,66        | 3,16        | 3,68        |
| 27  | 1,44        | 1,46        | 1,20        | 0,40        | 0,31        | 0,60        | 1,63        | 1,59        | 2,27        | 2,82        | 3,16        | 3,74        |
| 28  | 1,44        | 1,46        | 1,17        | 0,37        | 0,31        | 0,60        | 1,63        | 1,59        | 2,32        | 2,99        | 3,16        | 3,89        |
| 29  | 1,44        |             | 1,17        | 0,36        | 0,31        | 0,60        | 1,63        | 1,59        | 2,34        | 3,15        | 3,16        | 4,01        |
| 30  | 1,44        |             | 1,16        | 0,36        | 0,32        | 0,60        | 1,63        | 1,59        | 2,35        | 3,28        | 3,16        | 4,11        |
| 31  | 1,44        |             | 1,16        |             | 0,33        |             | 1,64        | 1,59        |             | 3,28        |             | 4,24        |
| <b>1,67</b>   | <b>1,39</b> | <b>1,44</b> | <b>1,37</b> | <b>0,89</b> | <b>0,37</b> | <b>0,59</b> | <b>1,44</b> | <b>1,61</b> | <b>1,76</b> | <b>2,49</b> | <b>3,20</b> | <b>3,37</b> |



### CV-Helios Network Annual Final Report for 2009

| NOAA Regions year 2009 |      |          |       |      |       | 30 regions |      |      |       |      |       |
|------------------------|------|----------|-------|------|-------|------------|------|------|-------|------|-------|
| Reg.                   | Date | Lat.     | Long. | Rot. | Class | Reg.       | Date | Lat. | Long. | Rot. | Class |
| 1                      | 1010 | 10.01.09 | 18    | 19   | 2078  | BXO        | 271  |      |       |      |       |
| 2                      | 1011 | 20.01.09 | -12   | 305  | 2079  | BXO        | 272  |      |       |      |       |
| 3                      | 1012 | 12.02.09 | -06   | 275  | 2080  | AXX        | 273  |      |       |      |       |
| 4                      | 1013 | 25.02.09 | 26    | 146  | 2080  | CSO        | 274  |      |       |      |       |
| 5                      | 1014 | 07.03.09 | -04   | 34   | 2080  | BXO        | 275  |      |       |      |       |
| 6                      | 1015 | 22.04.09 | 22    | 213  | 2082  | AXX        | 276  |      |       |      |       |
| 7                      | 1016 | 30.04.09 | -08   | 106  | 2082  | CAO        | 277  |      |       |      |       |
| 8                      | 1017 | 14.05.09 | 18    | 190  | 2083  | BXO        | 278  |      |       |      |       |
| 9                      | 1018 | 24.05.09 | -33   | 46   | 2083  | BXO        | 279  |      |       |      |       |
| 10                     | 1019 | 01.06.09 | 27    | 298  | 2084  | BXO        | 280  |      |       |      |       |
| 11                     | 1020 | 09.06.09 | 22    | 225  | 2084  | BXO        | 281  |      |       |      |       |
| 12                     | 1021 | 18.06.09 | -16   | 184  | 2084  | AXX        | 282  |      |       |      |       |
| 13                     | 1022 | 22.06.09 | -27   | 45   | 2084  | BXO        | 283  |      |       |      |       |
| 14                     | 1023 | 23.06.09 | -22   | 18   | 2084  | CSO        | 284  |      |       |      |       |
| 15                     | 1024 | 04.07.09 | -25   | 246  | 2085  | DSO        | 285  |      |       |      |       |
| 16                     | 1025 | 01.09.09 | 17    | 169  | 2087  | BXO        | 286  |      |       |      |       |
| 17                     | 1026 | 22.09.09 | -29   | 221  | 2088  | AXX        | 287  |      |       |      |       |
| 18                     | 1027 | 23.09.09 | 24    | 239  | 2088  | DRO        | 288  |      |       |      |       |
| 19                     | 1028 | 21.10.09 | 26    | 211  | 2089  | AXX        | 289  |      |       |      |       |
| 20                     | 1029 | 24.10.09 | 14    | 208  | 2089  | DSI        | 290  |      |       |      |       |
| 21                     | 1030 | 06.11.09 | 25    | 46   | 2089  | CRO        | 291  |      |       |      |       |
| 22                     | 1031 | 16.11.09 | 30    | 258  | 2090  | AXX        | 292  |      |       |      |       |
| 23                     | 1032 | 19.11.09 | 17    | 218  | 2090  | BXO        | 293  |      |       |      |       |
| 24                     | 1033 | 19.11.09 | 21    | 191  | 2090  | BXO        | 294  |      |       |      |       |
| 25                     | 1034 | 10.12.09 | 18    | 250  | 2091  | BXO        | 295  |      |       |      |       |
| 26                     | 1035 | 15.12.09 | 31    | 250  | 2091  | BXO        | 296  |      |       |      |       |
| 27                     | 1036 | 20.12.09 | -29   | 210  | 2091  | BXO        | 297  |      |       |      |       |
| 28                     | 1037 | 20.12.09 | 18    | 137  | 2091  | BXO        | 298  |      |       |      |       |
| 29                     | 1038 | 21.12.09 | 16    | 204  | 2091  | AXX        | 299  |      |       |      |       |
| 30                     | 1039 | 27.12.09 | -26   | 53   | 2091  | BXO        | 300  |      |       |      |       |
| 31                     |      |          |       |      |       |            | 301  |      |       |      |       |
| 32                     |      |          |       |      |       |            | 302  |      |       |      |       |
| 33                     |      |          |       |      |       |            | 303  |      |       |      |       |
| 34                     |      |          |       |      |       |            | 304  |      |       |      |       |
| 35                     |      |          |       |      |       |            | 305  |      |       |      |       |
| 36                     |      |          |       |      |       |            | 306  |      |       |      |       |
| 37                     |      |          |       |      |       |            | 307  |      |       |      |       |
| 38                     |      |          |       |      |       |            | 308  |      |       |      |       |
| 39                     |      |          |       |      |       |            | 309  |      |       |      |       |
| 40                     |      |          |       |      |       |            | 310  |      |       |      |       |
| 41                     |      |          |       |      |       |            | 311  |      |       |      |       |
| 42                     |      |          |       |      |       |            | 312  |      |       |      |       |
| 43                     |      |          |       |      |       |            | 313  |      |       |      |       |
| 44                     |      |          |       |      |       |            | 314  |      |       |      |       |
| 45                     |      |          |       |      |       |            | 315  |      |       |      |       |
| 46                     |      |          |       |      |       |            | 316  |      |       |      |       |
| 47                     |      |          |       |      |       |            | 317  |      |       |      |       |
| 48                     |      |          |       |      |       |            | 318  |      |       |      |       |
| 49                     |      |          |       |      |       |            | 319  |      |       |      |       |
| 50                     |      |          |       |      |       |            | 320  |      |       |      |       |
| 51                     |      |          |       |      |       |            | 321  |      |       |      |       |
| 52                     |      |          |       |      |       |            | 322  |      |       |      |       |
| 53                     |      |          |       |      |       |            | 323  |      |       |      |       |
| 54                     |      |          |       |      |       |            | 324  |      |       |      |       |
| 55                     |      |          |       |      |       |            | 325  |      |       |      |       |
| 56                     |      |          |       |      |       |            | 326  |      |       |      |       |
| 57                     |      |          |       |      |       |            | 327  |      |       |      |       |
| 58                     |      |          |       |      |       |            | 328  |      |       |      |       |
| 59                     |      |          |       |      |       |            | 329  |      |       |      |       |
| 60                     |      |          |       |      |       |            | 330  |      |       |      |       |
| 61                     |      |          |       |      |       |            | 331  |      |       |      |       |
| 62                     |      |          |       |      |       |            | 332  |      |       |      |       |
| 63                     |      |          |       |      |       |            | 333  |      |       |      |       |
| 64                     |      |          |       |      |       |            | 334  |      |       |      |       |
| 65                     |      |          |       |      |       |            | 335  |      |       |      |       |
| 66                     |      |          |       |      |       |            | 336  |      |       |      |       |
| 67                     |      |          |       |      |       |            | 337  |      |       |      |       |
| 68                     |      |          |       |      |       |            | 338  |      |       |      |       |
| 69                     |      |          |       |      |       |            | 339  |      |       |      |       |
| 70                     |      |          |       |      |       |            | 340  |      |       |      |       |
| 71                     |      |          |       |      |       |            | 341  |      |       |      |       |
| 72                     |      |          |       |      |       |            | 342  |      |       |      |       |
| 73                     |      |          |       |      |       |            | 343  |      |       |      |       |
| 74                     |      |          |       |      |       |            | 344  |      |       |      |       |
| 75                     |      |          |       |      |       |            | 345  |      |       |      |       |
| 76                     |      |          |       |      |       |            | 346  |      |       |      |       |
| 77                     |      |          |       |      |       |            | 347  |      |       |      |       |
| 78                     |      |          |       |      |       |            | 348  |      |       |      |       |
| 79                     |      |          |       |      |       |            | 349  |      |       |      |       |
| 80                     |      |          |       |      |       |            | 350  |      |       |      |       |
| 81                     |      |          |       |      |       |            | 351  |      |       |      |       |
| 82                     |      |          |       |      |       |            | 352  |      |       |      |       |
| 83                     |      |          |       |      |       |            | 353  |      |       |      |       |
| 84                     |      |          |       |      |       |            | 354  |      |       |      |       |
| 85                     |      |          |       |      |       |            | 355  |      |       |      |       |
| 86                     |      |          |       |      |       |            | 356  |      |       |      |       |
| 87                     |      |          |       |      |       |            | 357  |      |       |      |       |
| 88                     |      |          |       |      |       |            | 358  |      |       |      |       |
| 89                     |      |          |       |      |       |            | 359  |      |       |      |       |
| 90                     |      |          |       |      |       |            | 360  |      |       |      |       |

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### CV-Helios Network Annual Final Report for 2009

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### CV-Helios Network Annual Final Report for 2009

#### ZÜRICH/McINTOSH-CLASSIFICATIONS DISTRIBUTION for the year 2009

| A      | B      | C     | D     | E   | F   | H   |
|--------|--------|-------|-------|-----|-----|-----|
| AXX    | BXO    | CRO   | DRO   | ERO | FRO | HRX |
| 23,3 % | 53,3 % | 3,3 % | 3,3 % |     |     |     |
|        | BXI    | CRI   | DRI   | ERI | FRI | HAX |
|        |        |       |       |     |     |     |
|        | CAO    | DAO   | EAO   | FAO | HSX |     |
|        | 3,3 %  |       |       |     |     |     |
|        | CAI    | DAI   | EAI   | FAI | HKX |     |
|        |        |       |       |     |     |     |
|        | CSO    | DSO   | ESO   | FSO | HHX |     |
|        | 6,7 %  | 3,3 % |       |     |     |     |
|        | CSI    | DSI   | ESI   | FSI |     |     |
|        |        | 3,3 % |       |     |     |     |
|        | CKO    | DAC   | EAC   | FAC |     |     |
|        |        |       |       |     |     |     |
|        | CKI    | DSC   | ESC   | FSC |     |     |
|        |        |       |       |     |     |     |
|        | CHO    | DKO   | EKO   | FKO |     |     |
|        |        |       |       |     |     |     |
|        | CHI    | DKI   | EKI   | FKI |     |     |
|        |        |       |       |     |     |     |
|        |        | DHO   | EHO   | FHO |     |     |
|        |        |       |       |     |     |     |
|        |        | DHI   | EHI   | FHI |     |     |
|        |        |       |       |     |     |     |
|        |        | DKC   | EKC   | FKC |     |     |
|        |        |       |       |     |     |     |
|        |        | DHC   | EHC   | FHC |     |     |
|        |        |       |       |     |     |     |

#### SUNSPOT CLASS

1st letter

|   |           |        |
|---|-----------|--------|
|   | <b>30</b> |        |
| A | 7         | 23,3 % |
| B | 16        | 53,3 % |
| C | 4         | 13,3 % |
| D | 3         | 10,0 % |
| E | 0         | 0,0 %  |
| F | 0         | 0,0 %  |
| H | 0         | 0,0 %  |

#### MAIN SUNSPOT TYPE

2nd letter

|   |           |        |
|---|-----------|--------|
|   | <b>30</b> |        |
| X | 23        | 76,7 % |
| R | 2         | 6,7 %  |
| A | 1         | 3,3 %  |
| S | 4         | 13,3 % |
| K | 0         | 0,0 %  |
| H | 0         | 0,0 %  |

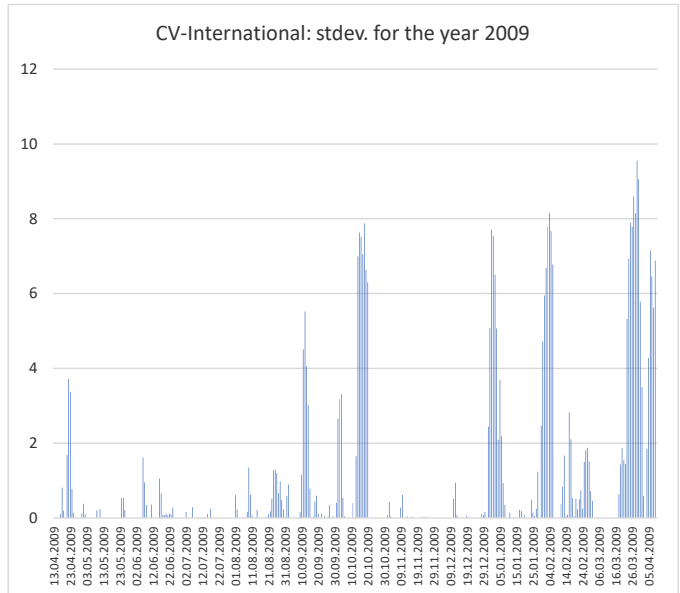
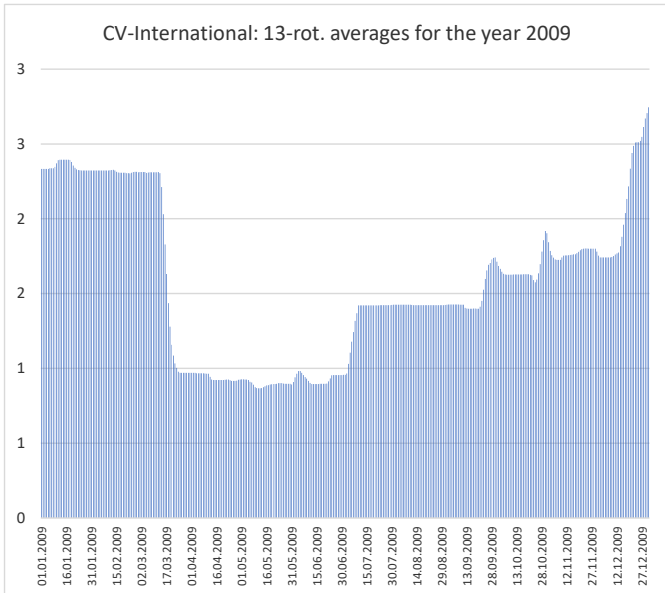
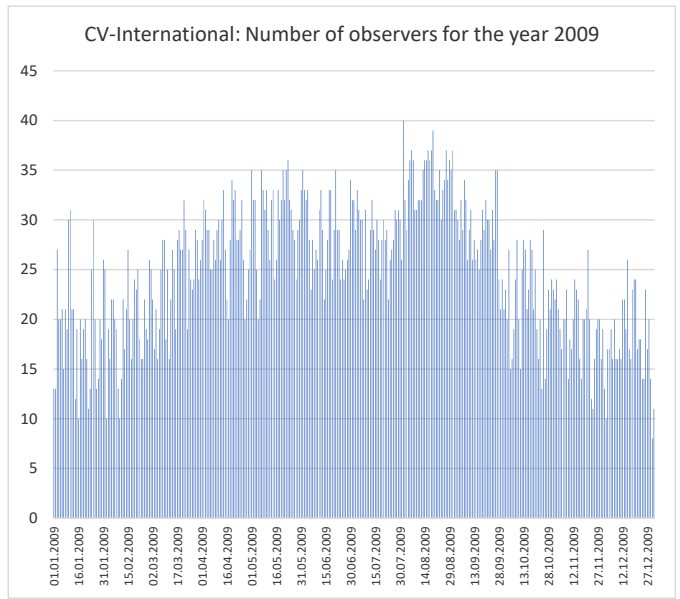
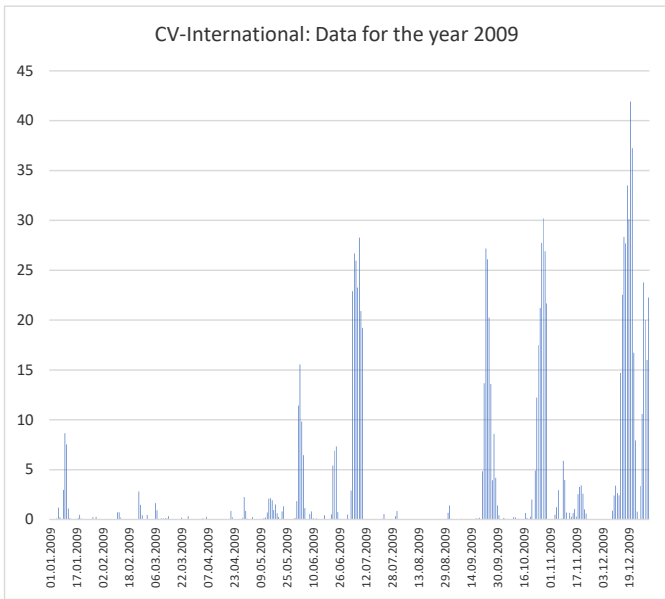
#### SUNSPOT DISTRIBUTION

3rd letter

|   |           |        |
|---|-----------|--------|
|   | <b>30</b> |        |
| X | 7         | 23,3 % |
| O | 22        | 73,3 % |
| I | 1         | 3,3 %  |
| C | 0         | 0,0 %  |

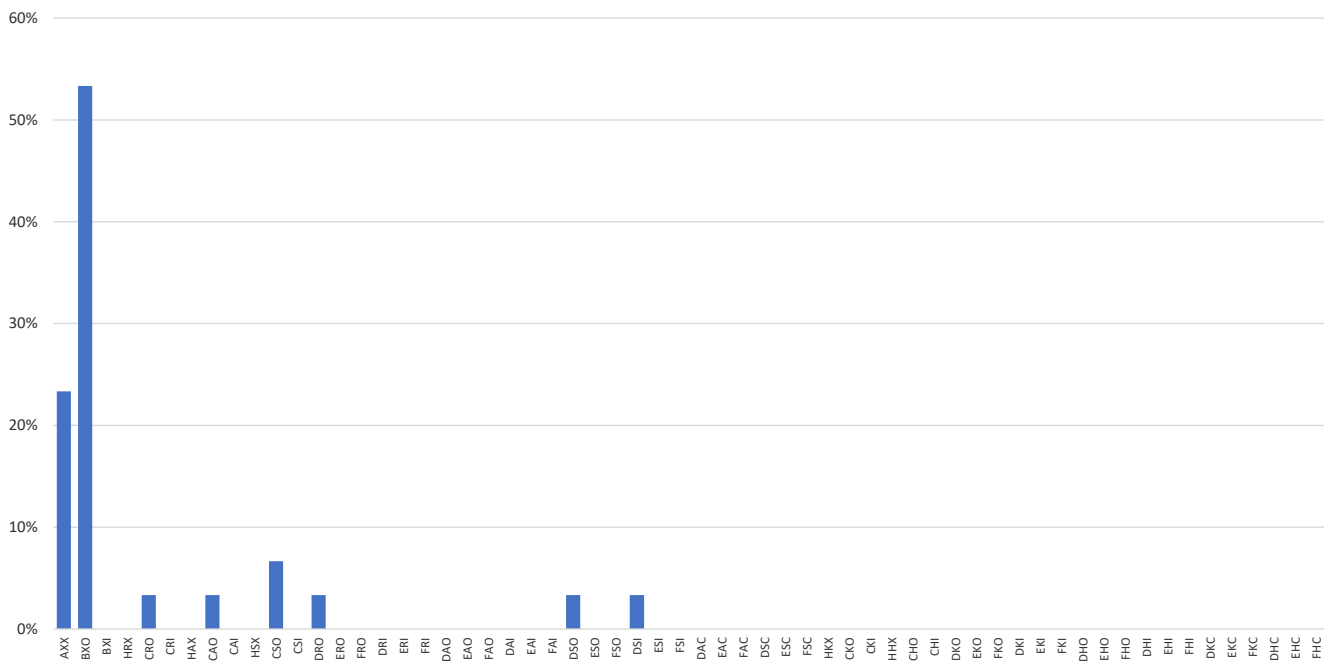
# CV-Helios Network Annual Final Report for 2009

## Graphics for the year 2009

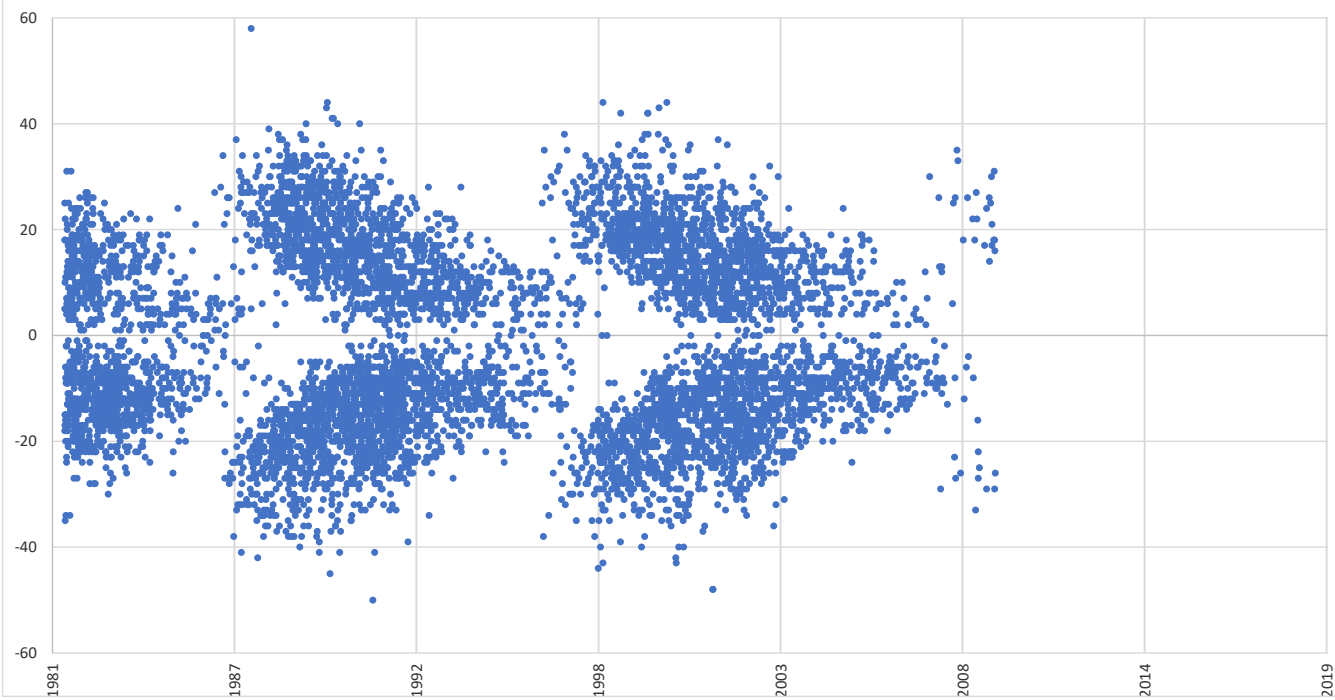


### CV-Helios Network Annual Final Report for 2009

Zürich/McIntosh-classifications denoted by NOAA/USAF for the year 2009



RGO/NOAA-USAF Sunspot Regions 1981-2009



## CV-Helios Network Annual Final Report for 2009

**CV-Helios Network - over 28 years in solar amateur astronomy service!**

There are now 7070 entries registered  
containing 111293 CV-observations!

**This AFR issued 1st April 2010**

### **CV-Helios Network**

Director/Coordinator: Kjell Inge Malde

Phone: +47 98 69 28 56

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[www.cv-helios.net](http://www.cv-helios.net)

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Worldwide Amateur Solar Observing Network  
Magnetic Sunspot Classifications Zürich/McIntosh system  
CV - Classification Values (Malde/1981) - numeric system  
Serving Amateur Solar Astronomy since 1981

Last updated/Editorial close: 08.04.2018 17:16 UTC