1. SUN ECLIPSE INFO


Sun Eclipse 1 August 2008 has N 126 in accordance with clasification. First Sun Eclipse of this series was in 1179, but only from 1882 a series of full sun eclipses began1882, 1900, 1918, 1936, 1954, 1972, 1990, 2008, 2026, 2044. Series ends in 2459.

The Map of Sun Eclipse 01 August 2008

Table 1 shows parameters for several sites. Time difference from Grinvich time is 7 hours.
P1 - the moment of the first contact;  U1 - the moment of the second contact (beginning of a full phase);  U2 - the moment of the third contact (the end of a full phase);  P2 – the moment of the fourth contact

<table>
<thead>
<tr>
<th>Site</th>
<th>Long., min</th>
<th>Max</th>
<th>Phase</th>
<th>P1</th>
<th>U1</th>
<th>U2</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novosibirsk</td>
<td>+55 02/82 55</td>
<td>2:21</td>
<td>17 45 9</td>
<td>1,017</td>
<td>16 41 17</td>
<td>17 43 58</td>
<td>17 46 20</td>
</tr>
<tr>
<td>Ob</td>
<td>+55 0/82 43</td>
<td>2:22,9</td>
<td>17 45 9</td>
<td>1,019</td>
<td>16 41 13</td>
<td>17 43 58</td>
<td>17 46 21</td>
</tr>
<tr>
<td>Berdsk</td>
<td>+54 47/83 2</td>
<td>2:22,1</td>
<td>17 45 40</td>
<td>1,018</td>
<td>16 41 49</td>
<td>17 44 29</td>
<td>17 46 51</td>
</tr>
</tbody>
</table>

2. PROTOCOL OF MEASUREMENTS
Equipment:

EPC/GDV Camera with battery power supply.
Computer with any type of power supply.
Sensor – antenna.
Air fan – home appliance or computer.

Protocol of measurements:

1. Metal cylinder – test-object is positioned on the electrode. The wire is fixed with a tape – any movement of the test-object will distort results. Fan is placed nearby the Camera for constant ventilation.
2. Instrument warming up. Test-object is connected with grounding jack of the Camera. Regime 1, series of images, 3 s interval, during 1 hour.
3. Test-object wire is connected with Antenna.
4. Background measurement. Regime 1, series of images, 3 s interval, during 1 hour.
5. Measurement during and after solar eclipse in the same regime during 1 hour or more.

Processing: “GDV SciLab” program.

3. ORGANISATION OF THE EXPERIMENT

In the process 6 EPC/GDV Cameras have been used.

Positions:

1. Novosibirsk Academic City – Hypo-magnet Camera.
4. Berdsk
5. Irkutsk

Overall organization: K. Korotkov and Oleg Sorokin.

Researchers:
Research in the Novosibirsk Academic City was done in the frame of the big program under the leadership and with the help of professor Alexander Trofimov.

The protocol of measurements in Novosibirsk city center was different from all other sites and results are not included in this report.

4. RESULTS

Measurements with antenna started at about 16.30. Signal was very stable for all the measured sites: variability of data was about 3% before the sun eclipse and less than 1% after the sun eclipse. Significant variations in the precise structure of a signal was recorded.

Graphs 1-7 demonstrate time dynamics of Area changes, graphs 8-14 time dynamics of Intensity. On the abscise axis the N of point and absolute time in Novosibirsk is given: 163004 = 16 h 30 min 04 sec. Arrows roughly mark the time of full sun eclipse (1743 on Novosibirsk time).

As we see from the graphs, they all have two clear phases: before and after the sun eclipse. Before sun eclipse all graphs demonstrate longitudinal waves. After the sun eclipse signal stabilizes. Two types of dynamics before the sun eclipse are recorded: decreasing (for two instruments) and increasing (for five instruments).

Time dynamics of graphs fig 1 and 2 are quite similar. There are correlations of position of three local extremum. At about 17.39 an increased variability of data is observed.

Graphs of fig. 3-5 do not have decreasing trend typical for graphs fig. 1 and 2, but they have local extremums as well. Rough position of the extremis are given in Table 2. As we see from Table 2, the position of some extremums are quite similar.

<table>
<thead>
<tr>
<th>Place</th>
<th>Hypo-magnet</th>
<th>Placebo</th>
<th>Countryside</th>
<th>City Center</th>
<th>Berdsk</th>
<th>Abakan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rough Time of max</td>
<td>16-30</td>
<td>16-35</td>
<td>16-37</td>
<td>16-31</td>
<td>16-32</td>
<td></td>
</tr>
<tr>
<td>16-35</td>
<td>16-35</td>
<td>16-42</td>
<td>16-50</td>
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<td>16-45</td>
<td>16-46</td>
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<tr>
<td>17-15</td>
<td>16-55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-25</td>
<td></td>
<td></td>
<td></td>
<td>17-23</td>
<td></td>
<td>17-19</td>
</tr>
</tbody>
</table>
Fig.1. Area time dynamics in the Placebo of the Hypo-magnet Camera
Fig. 2. Area time dynamics in Berdsk

Fig. 3. Area time dynamics in Hypo-magnet Camera
Fig. 4. Area time dynamics in the countryside

Fig. 5. Area time dynamics in Irkutsk

In Abakan the amplitude of a signal changed abruptly at 17.35. We do not know the reason of this situation so we present graphs before and after the sun eclipse separately.
Fig. 6. Area time dynamics in Abakan before the sun eclipse.

Fig. 6. Area time dynamics in Abakan after the sun eclipse.
Fig. 8. Time dynamics of Signal Intensity in Hypo-magnet Camera

Fig. 9. Time dynamics of Signal Intensity in Placebo Hypo-magnet camera
Fig. 10. Time dynamics of Signal Intensity in Berdsk

Fig. 11. Time dynamics of Signal Intensity in countryside
Fig. 12. Time dynamics of signal intensity in Irkutsk.

Fig. 13. Time dynamics of signal intensity in Abakan before the sun eclipse.
Fig. 14. Time dynamics of signal intensity in Abakan after the sun eclipse.

Fig. 15 and Table 3 demonstrate data on Area and Intensity variability before and after the sun eclipse (ratio between Standard Deviation and Average in %).

Table 3. Data Variability

<table>
<thead>
<tr>
<th>Area</th>
<th>Before Hypo-magnet</th>
<th>After</th>
<th>Before Placebo</th>
<th>After</th>
<th>Before Countryside</th>
<th>After</th>
<th>Before Berdsk</th>
<th>After</th>
<th>Before Irkutsk</th>
<th>After</th>
<th>Before Abakan</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>3778.9</td>
<td>3829.1</td>
<td>7719.5</td>
<td>7411.2</td>
<td>6929.1</td>
<td>6988.7</td>
<td>4482.1</td>
<td>4302.0</td>
<td>8325.7</td>
<td>8632.3</td>
<td>12933.2</td>
<td>3443.2</td>
</tr>
<tr>
<td>St. Deviation</td>
<td>111.4</td>
<td>51.55</td>
<td>275.22</td>
<td>104.39</td>
<td>141.21</td>
<td>141.16</td>
<td>302.46</td>
<td>73.19</td>
<td>228.7</td>
<td>89.9</td>
<td>234.4</td>
<td>55.8</td>
</tr>
<tr>
<td>Variability</td>
<td>0.029</td>
<td>0.013</td>
<td>0.036</td>
<td>0.014</td>
<td>0.020</td>
<td>0.067</td>
<td>0.017</td>
<td>0.0275</td>
<td>0.0104</td>
<td>0.0181</td>
<td>0.0162</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Intensity</th>
<th>Before Hypo-magnet</th>
<th>After</th>
<th>Before Placebo</th>
<th>After</th>
<th>Before Countryside</th>
<th>After</th>
<th>Before Berdsk</th>
<th>After</th>
<th>Before Irkutsk</th>
<th>After</th>
<th>Before Abakan</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>57.954</td>
<td>57.84</td>
<td>57.22</td>
<td>58.06</td>
<td>91.20</td>
<td>93.33</td>
<td>59.23</td>
<td>60.25</td>
<td>96.7</td>
<td>100.4</td>
<td>113.7</td>
<td>56.7</td>
</tr>
<tr>
<td>St. Deviation</td>
<td>1.347</td>
<td>0.44</td>
<td>1.01</td>
<td>0.74</td>
<td>2.41</td>
<td>0.83</td>
<td>1.45</td>
<td>0.48</td>
<td>2.3</td>
<td>0.6</td>
<td>3.9</td>
<td>0.4</td>
</tr>
<tr>
<td>Variability</td>
<td>0.023</td>
<td>0.008</td>
<td>0.018</td>
<td>0.013</td>
<td>0.026</td>
<td>0.009</td>
<td>0.025</td>
<td>0.008</td>
<td>0.0239</td>
<td>0.0062</td>
<td>0.034</td>
<td>0.008</td>
</tr>
</tbody>
</table>
Fig. 15. Area and Intensity data variability before (blue bars) and after (red bars) the sun eclipse.
CONCLUSIONS

1. Seven EPC/GDV positioned in different locations recorded statistically different signal in different phases of sun eclipse. Statistically significant difference of readings before and after with probability 99.99999 (p < 0.00001) both for Area and Intensity was found. For other parameters the difference was clear visible, but was not statistically significant in all cases.
2. Before sun eclipse longitudinal waves was recorded, their origin should be found.
3. Position of extremums concur for several EPC instruments. Some extremums are different.
4. Two instruments demonstrated signal with decreasing amplitude before the sun eclipse, other instruments demonstrated increasing trend of a signal before sun eclipse.
5. The highest amplitude of oscillations was found for the instrument positioned in the hypo-magnet camera.
6. In the phase after the sun eclipse all the instruments recorded very stable signal with variability less than 1%.
7. It is recommended to make similar measurements for longer time before the sun eclipse.
8. Presented results open up perspectives for EPC/GDV instruments applications for early registration of geophysical anomalies.

We appreciate your comments.
Thank you
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References