

fact that the detrimental effect on health is also noticeable in Bulgaria (1200 km northwest of the center of the spot).

Case of invasion of high energy alpha particle fluxes over Los Angeles County, State of California, USA, analyzed based on the proposed hypothetical mechanism

The choice of Los Angeles County, California, USA, as an example, is not accidental.

- The region has a high population density, i.e. it was expected that with an invasion of intense fluxes of high energy solar alpha particles, the described effect with an increased number of IHD deaths would be more noticeable for a densely populated region.
- The United States is a country with a high level of medical diagnostics and perhaps the best medical statistics in the world.
- Several intense streams of alpha particles reaching the Earth's orbit occurred between March 1st and March 10th 1995 according to data from the GOES-07 satellite, EPS sensor, channel A1. For the Los Angeles area, the geomagnetic induction vector descends from south to north with an angle (inclination) to the Earth's surface of 47.5° [17]. According to the proposed hypothetical mechanism, the maximum negative effect on the health of residents in Los Angeles County should be expected around the moments when the culmination of the Sun, increasing in spring and decreasing in autumn, coincides with the inclination of the vector of geomagnetic induction, i.e. reaching a value of 47.5°. This occurs around February 26 and October 15 [17]. At the beginning of March, the culmination of the Sun in the Los Angeles area is still close to the inclination of the geomagnetic vector for the area, when several high-magnitude alpha particle streams have been recorded during the first ten days of March 1995. According to the presented hypothetical mechanism, the alignment of the culmination

the mentioned streams.

The result of the study is shown in Table 1. It can be seen from the table (columns 3 and 4) that coronary disease mortality among Los Angeles County women for the study interval correlates with satellite-recorded (indicator) alpha particle fluxes. According to the hypothesized mechanism of the described phenomenon, the registered indicator fluxes alpha particles are associated with unregistered ones with much greater energy, allowing them to reach the Earth's surface and harm the health of the people into whose bodies they fall. It can be concluded that the unrecorded alpha particle flux is proportional to that recorded since the number of deaths is proportional to the magnitude of the alpha particle flux recorded. The number of deaths also depends on the distance between the point of impact of alpha particles on the Earth's surface and Los Angeles County (column 6 of the table). The moment of registration of the first indicator flow (March 2nd, 1995) coincides with the moment of culmination of the Sun just above Los Angeles County. The flow is of medium intensity, and the number of deaths moderately increases, but Los Angeles County likely remained on the western periphery of the deadly spot, as follows from the proposed hypothetical mechanism. At this time, the change in deaths follows exactly the change in alpha particle fluxes.

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| Survey dates | Number of women in Los Angeles County who died from ischemic heart disease | Difference between the diurnal number of deaths and their minimum on 8 March 1995 | Diurnal maximum of alpha particle flux, (number of particles).cm ⁻² .s ⁻¹ .sr ⁻¹ .MeV ⁻¹ | Geographical coordinates of alpha particle flux registration points | Distance from registration points of alpha radiation fluxes to Los Angeles, km |
|--------------|--|---|--|---|--|
| 01-03-1995 | 17 | 1 | 5010 | W123, N34.5 | 443.6 |
| 02-03-1995 | 22 | 6 | 8930 | W118, N34.5 | 54.1 |
| 03-03-1995 | 21 | 5 | 6190 | W124, N34.5 | 532.7 |
| 04-03-1995 | 18 | 2 | 564 | W116, N35 | 225.5 |
| 05-03-1995 | 26 | 10 | 19900 | W124, N35 | 540.4 |
| 06-03-1995 | 24 | 8 | 0.0796 | W169, N35 | Far from LA |
| 07-03-1995 | 22 | 6 | 0.0597 | W16, N35 | Far from LA |
| 08-03-1995 | 16 | 0 | 3600 | E139, N35.5 | Far from LA |
| 09-03-1995 | 17 | 1 | 6750 | E124, N36 | Far from LA |
| 10-03-1995 | 17 | 1 | 10.3 | E91, N35.5 | Far from LA |

The second indicator flux (March 5th, 1995) is of considerable magnitude. At the time of its registration, the Sun's culmination has

been over a point in the Pacific Ocean displaced about 500 km west of the city of Los Angeles. According to the predicted by the hypothetical mechanism, the main health impact should be expected to be in a deadly spot located east of the point of registration of the indicator flow. In line with this prediction, the number of deaths in Los Angeles County is increasing significantly as a result of the location of the county east relative to the point of registration of the stream where the spot with maximum negative health impacts is expected to be located. The larger magnitude of the indicator flux is likely related to a larger magnitude of the flux penetrating through the atmosphere alpha particles, resulting in a higher number of deaths.

That is, the number of deaths depends both on the distance between the observation point and the point of registration and on the magnitude of the stream. There has been a gradual decrease in deaths over the next two days after the impact. The last stream (March 9, 1995) was recorded at a time when the Sun was culminating in a point in the Pacific Ocean about 2,400 km west of the city of Los Angeles. Its lethal effect on the county is negligible because of the long distance. The above data allow estimation of the size of the deadly spot on the earth's surface: 1000 km–2000 km.

The moments of invasion of alpha particles are unpredictable, but the dates of maximum risk from them (the dates of coincidence of the directions of movement of the alpha particles and the geomagnetic vector) can be calculated according to the proposed hypothetical mechanism from the latitude data of the site [17]. For Los Angeles, the dates of maximum risk of defeat with alpha particles during an outdoor walk at noon were mentioned above - February 26 and October 15.

For the survey interval from March 1 to March 10th, 1995, 200 women died from IHD in Los Angeles County. For each day of the interval, the difference between the number of deaths during the day and the minimum number of deaths for this ten-day interval was calculated (columns 2 and 3 of Table 1). The sum of these differences is 40. Assuming that these 40 deaths were influenced by alpha particle fluxes in the interval studied, the contribution of alpha particle fluxes to female IHD mortality in Los Angeles County during the 10-day interval studied was 20%.

DISCUSSION & CONCLUSION

This work presents a study revealing an alarming phenomenon of correlation between the fluxes of solar alpha particles recorded by the satellites of the GOES series in the Earth's orbit and mortality from ischemic heart disease in Bulgaria.

The proposed hypothetical mechanism successfully indicates the dates of occurrence and explains the observed phenomenon based on data from satellite observations, as it was clarified for a remote from Bulgaria region-Los Angeles County, California, USA. The conclusion can be drawn, that the observed phenomenon is a planetary health problem.

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