



## **Cosmophysical and natural factors, and trauma occurrence level of people working and living behind the polar circle.**

Tatiana Novikova (1), Oleg Shumilov (2), Elena Kasatkina (2), and Alexey Chramov (3)

(1) Main Hospital, Kola Science Centre RAS, Apatity, Russian Federation (doctornov@yandex.ru), (2) Institute of North Industrial Ecology Problems, Kola Science Centre RAS, Apatity, Russia, (3) Baltic State Technical University, St.-Petersburg, Russia

Not many investigations were devoted to connection of extreme situation level studies of people working and living in specifically active in geophysical sense regions: auroral zone and polar cap. In the work are considered the traumatism level of employers working at the joint stock company Apatit, the largest mining and concentrating enterprise in Europe and Russia, for the period 2000–2010 years. The enterprise is located in twin towns Kirovsk and Apatity (67.58 N; 33.31 E) right at auroral zone of geomagnetic activity.

The main conclusions look like to be as following:

1. Trauma occurrence level demonstrated variable level roughly following solar activity level at the period: maximal in 2002 and minimal in 2006. It is interesting that the traumatism trend resembles that of suicides for peoples living in Kirovsk (not only miners).
2. In a seasonal distribution one can select several clear occurrence maxima: in March–April, June–July, September–October and December–January. The first three maxima coincide with that in the seasonal distribution of the most intensive geomagnetic ( $A_p > 150$  nT) storms for the period considered. The fourth winter maximum coincides to the maximum in the seasonal distribution of cardiovascular diseases in Kirovsk and seems not to be connected to geophysical distribution and takes place during the hardest life period of people living far in the North (dark and cold Polar Nights).
3. Analysis of some concrete geomagnetic storms and trauma appearance behind the polar circle supports above mentioned connection between geomagnetic disturbances and extreme situation events.

The conclusion may be used in preventive measures of traumatism taking into account the world wide tendency of spreading economic activity to the Arctic (and possibly Antarctic) region of the Earth (planned development of Stockman gas field in Barents sea etc.).