



## **Geosciences help to protect human health: estimation of the adsorbed radiation doses while flight journeys, as important step to radiation risk assessment**

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Estimation of the adsorbed radiation dose while flight journeys is a complex problem, which should be solved to get correct evaluation of equivalent effective doses and radiation risk assessment. Direct measurements of the adsorbed dose in the aircrafts during regional flights (3-10 hours) has shown that the radiation in the plane may increase 10-15 times (to 2-4 mSv/h) compared to the values on the surface of the Earth (0.2-0.5 mSv/h). Results of instrumental research confirmed by the other investigations.

It is a fact that adsorbed doses per year while flight journeys are less than doses from medical tests. However, while flight journeys passengers get the same doses as nuclear power plant staff, people in zones of natural radiation anomalies and so should be evaluated.

According to the authors' research, flight journeys are safe enough, when solar activity is normal and if we fly under altitude of 18 km (as usual, while intercontinental flights). Most of people travel by plane not so often, but if flight is lasting in dangerous periods of solar activity (powerful solar winds and magnetic field storms), passengers and flight crew can adsorb great amount of radiation doses. People, who spend more than 500 hours in flight journeys (pilots, business oriented persons', government representatives, etc.) get amount of radiation, which can negatively influence on health and provoke diseases, such as cancer. Authors consider that problem actual and researches are still going on.

It is revealed, that radiation can be calculated, using special equations. Great part of radiation depends on very variable outer-space component and less variable solar. Accurate calculations of doses will be possible, when we will take into account all features of radiation distribution (time, season of year and exact time of the day, duration of flight), technical features of aircraft and logistics of flight (altitude, latitude). Results of first attempts of radiation doses modelling confirmed instrumental evaluation of doses, which passengers get while flight journeys. Further researches of radiation doses while flight journeys are going on.

That example of researches shows that geoscience and social interests and problems are closely connected. Human society could not develop properly and safely without cooperation with geological science. As we see, geophysical methods can be used to count variations of natural radiation in spatial and time dimensions, which influence on level of radiation in aircrafts. As a result of such researches important conclusions to reduce radiation risks and collective doses of adsorbed radiation can be done. Geophysicists work hard on solving different problems of monitoring and analysis of natural surroundings to protect humanity and create safe, well-organized living surroundings.

Key words: Solar radiation, flight journeys, dose of adsorbed radiation.