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Mechanisms of Diffusion of Viruses and Bacteria in an Ionized Atmosphere: A Study Project

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A project to be carried out at the National Institute of Health of Italy (Istituto Superiore di Sanita' – ISS) is outlined on the study of the mechanisms of diffusion of viruses and bacteria in an ionized atmosphere inside civilian airline aircraft at cruise altitude. The study will include the evaluation of the ionization conditions within the aircraft cabin by computing particle transport throughout the atmosphere. The incoming particles are filtered with a new fully angular dependent geomagnetic cut-off rigidity model, as a function of latitude, longitude, arrival direction, altitude and time. The ionization patters are computed along specific flight legs, taking into account actual flight profiles for all different routes and the variations with time of solar and geomagnetic parameters. The effects of cabin air recirculation and filtration systems are to be taken into account in order to assess the possible effects of the increased ionization on the mechanisms of diffusion of viruses and bacteria with respect to sea level conditions. Particular attention will be given to Avian flu virus. //Keywords: Radiation; Earth; atmosphere; modeling; ionization; viruses; bacteria; infection.