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Presenting the AtRIS code as a future tool to investigate the atmospheric impactof SEP events

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Within the wider scope of improving Space weather forecast by the EUHFORIA project, we present an updated version of the AtRIS code designed to simulate the count rates and dose deposits of space weather events in the atmosphere. As more and more of modern technological infrastructure is sensitive to radiation exposure space weather forecast can develop into a critical tool to protect it from possible damage. Thereby, AtRIS can be applied to analyse the impact of past Solar Energetic Particle (SEP) events, complementary to the analysis and comparisons of measurements both at top the atmosphere and at ground level by e.g. NAVIDOS and DOSTEL. AtRIS thereby is designed as a framework of the well established GEANT4 code, offering the possibility to implement the atmospheric composition in a layer-wise model. Furthermore, it offers the possibility to select the thickness of the shielding between 0 and 20 mm of aluminium. Here we will present the physics implemented into AtRIS, its validation, and show preliminary results for selected past events utilising different layers of shielding.The Kiel team received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 870405.