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Preliminary results of the radioactive debris dispersion investigation after a hypothetical nuclear accident at Akkuyu Nuclear Power Plant

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One of the most important difficulties in the fight against the environmental pollution and its consequences (burden on human health, climate change and others) is the development of alternative electric power sources in the place of the polluting electric power plants consuming fossil fuels. Nuclear power and nuclear plants are one of these alternatives which present a lot of advantages like they do not produce air pollutants nor greenhouse gases, the power production is controlled so it can be synchronized to power needs and is affordable. The main disadvantage is the damage which can be caused by a nuclear accident. According to nuclear accident's conditions the damage may be distributed to areas far enough from the place of the accident. A main precaution against such an accident is the ability to predict which areas will be affected by the radioactive debris exposed by the nuclear accident. At Akkuyu, Turkey, it is constructed the first Turkish nuclear power plant which will cover around 10% of country's electric power needs. In the framework of this study, they are investigated different scenarios about the dispersion of the radioactive debris which will be exposed in the atmosphere after an explosion. The investigation is based on the SNAP (Severe Nuclear Accident Program) model and meteorological conditions met at the specific area. The last version of the SNAP model has been developed so it can be applied for simulating dispersion of radioactive debris from nuclear accident as well as to simulate movement of the radioactive cloud from nuclear explosion. In addition, the model can be used for estimating three-dimensional trajectories from arbitrary point in the model domain. The obtained results for different cases of nuclear accidents and meteorological conditions is going to be presented.

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