

The UTU-SEP Products in ESA's Space Radiation Expert Service Centre



UNIVERSITY OF TURKU

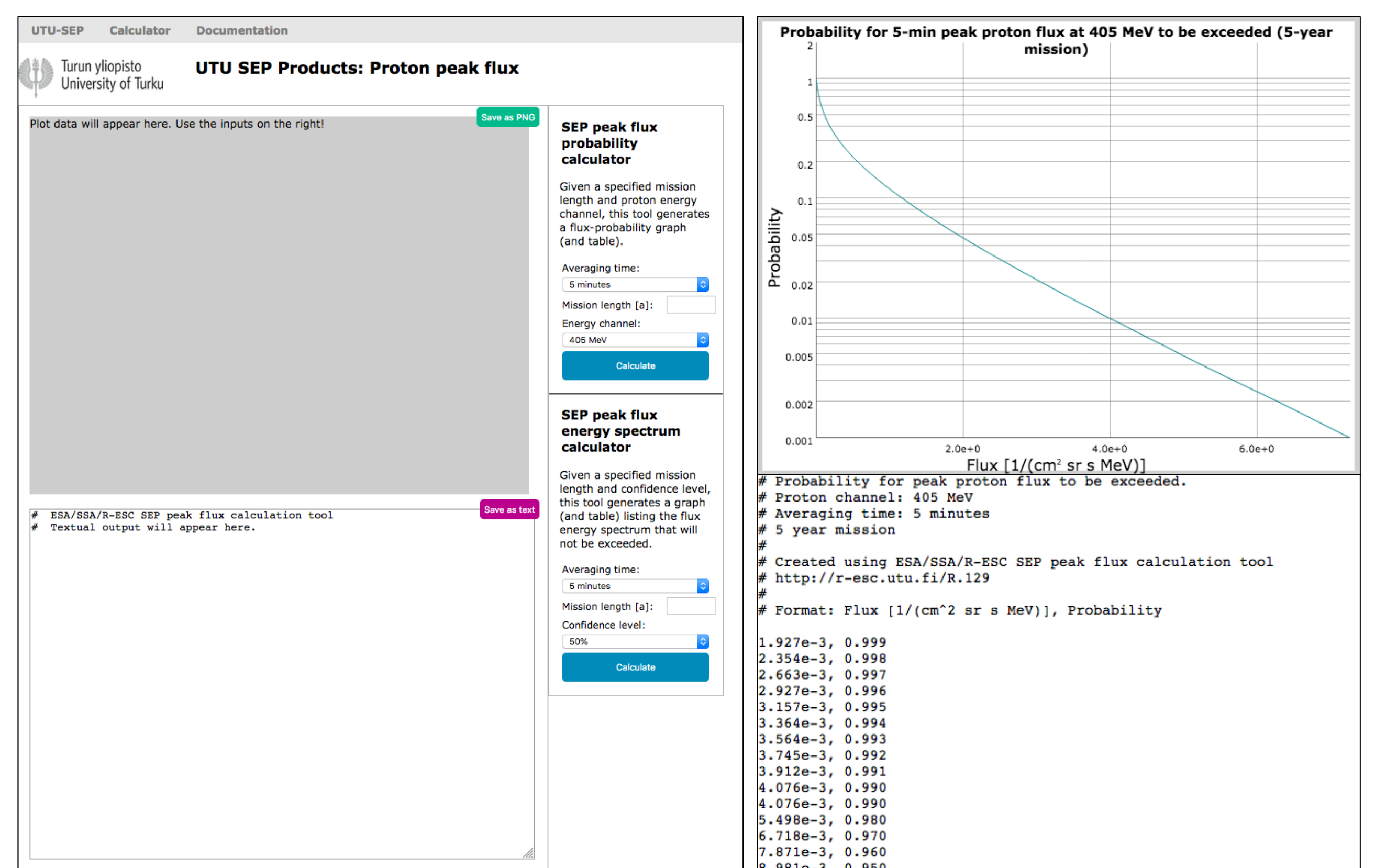
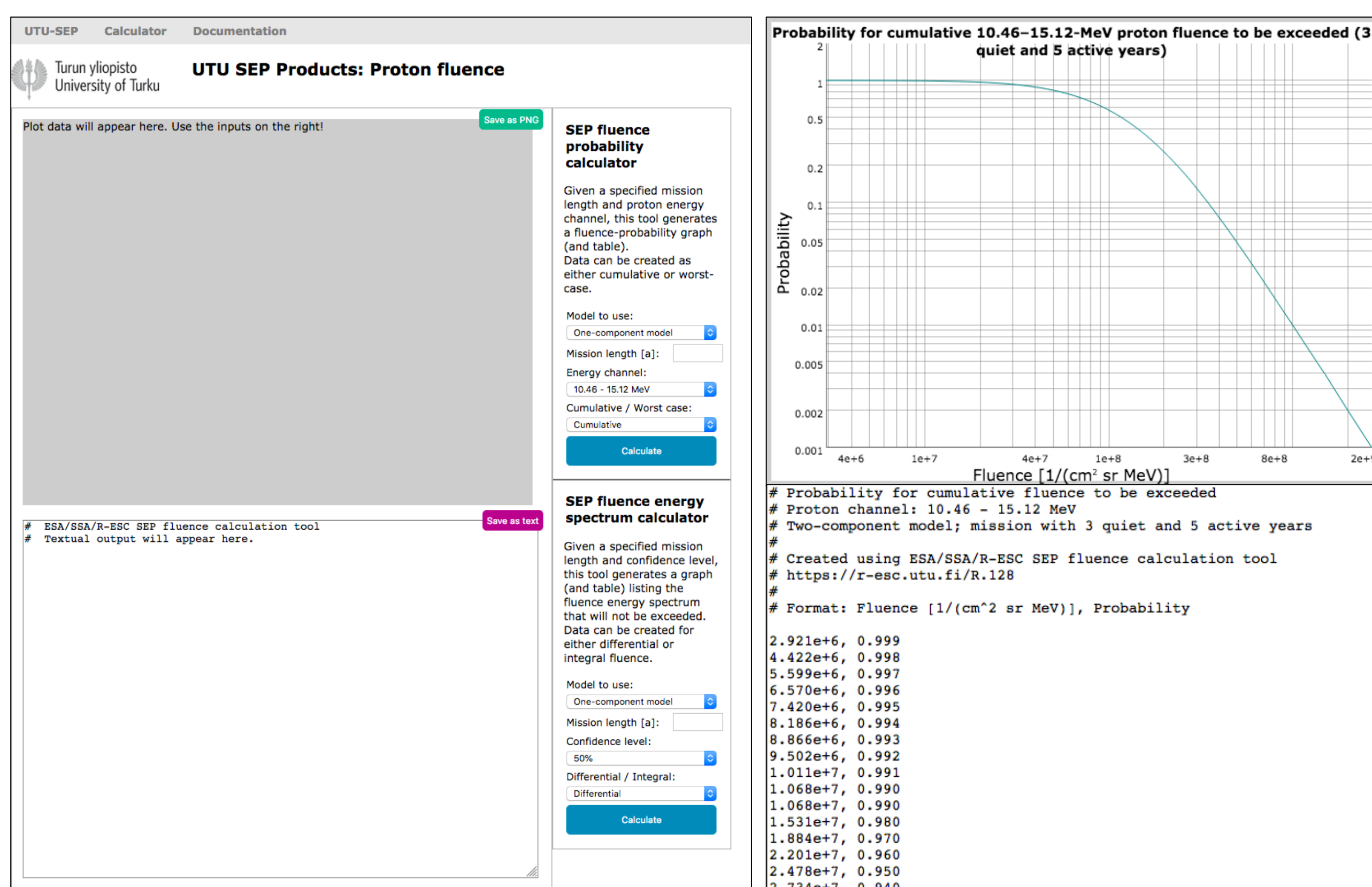


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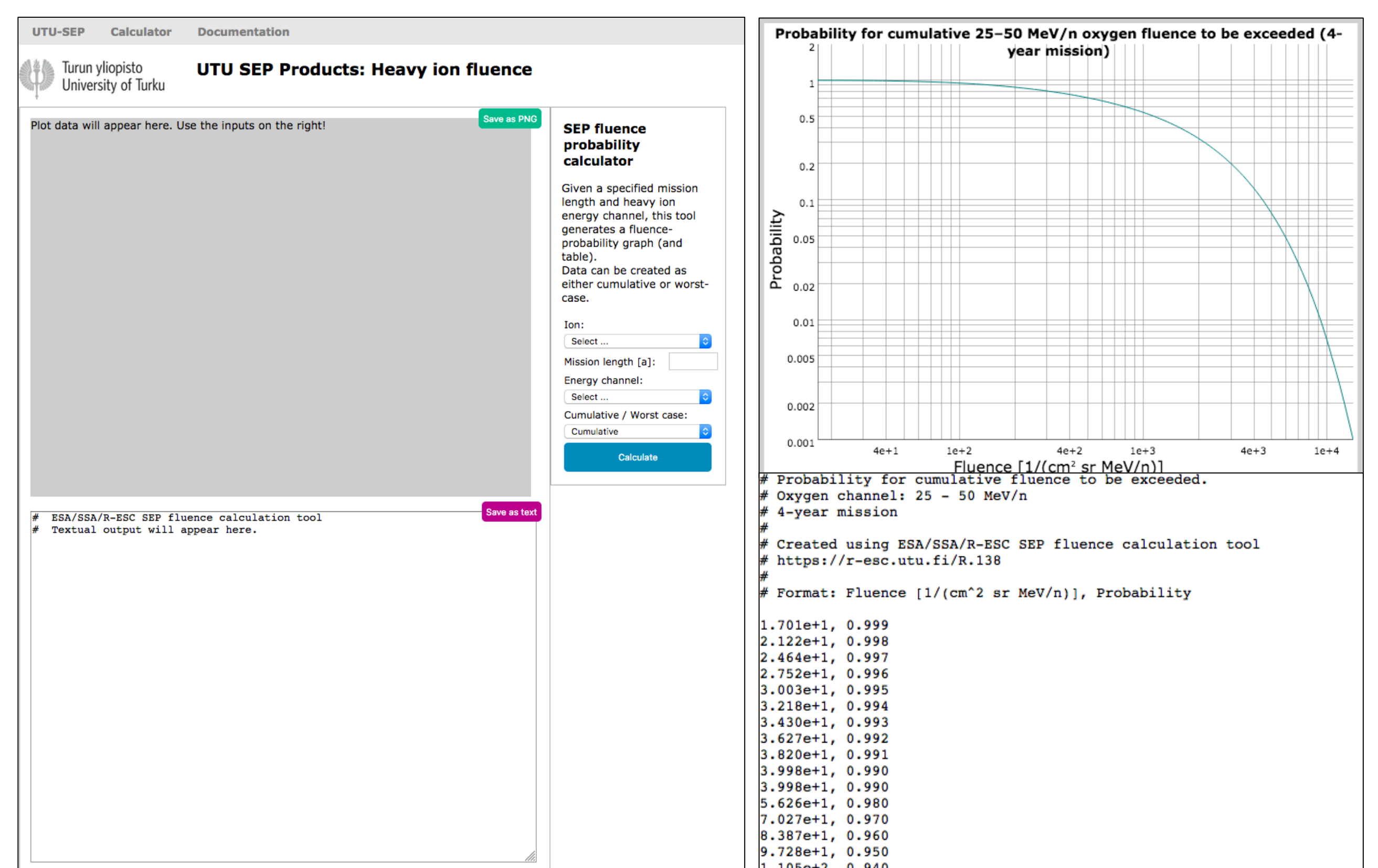
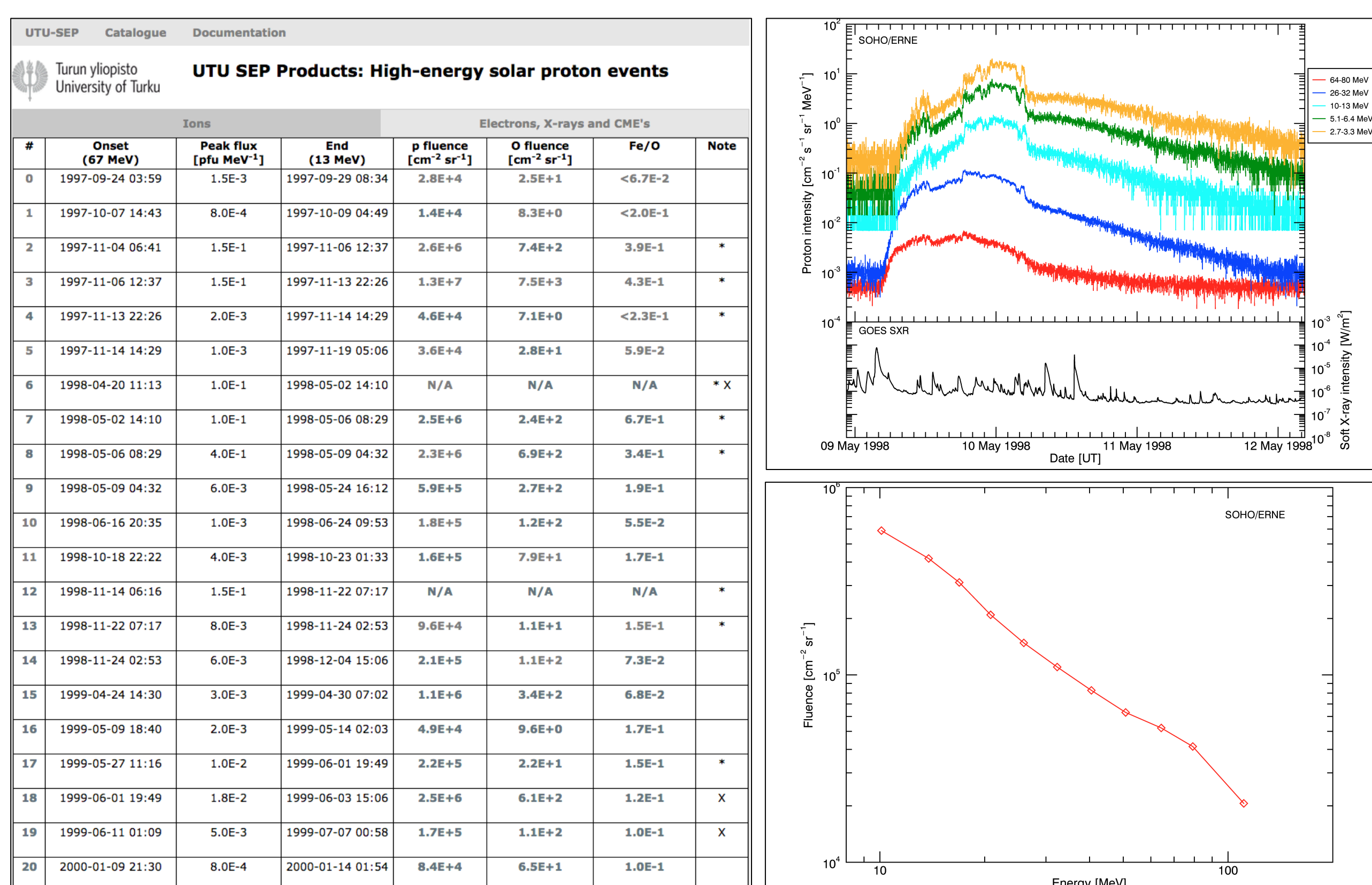
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UTU-SEP is a collection of tools available through ESA's Space Radiation Expert Service Centre (R-ESC), which are aimed at assessment of the high-energy particle radiation environment over long time periods, like space missions. It consists of four products described below. Access to the product is via ESA-SWE portal at swe.ssa.esa.int.



The UTU-SEP product R.128 is a tool for modeling solar energetic proton fluence at high energies. It provides the fluence-probability curve for a selected energy channel, and the fluence energy spectrum at a selected confidence level, both for a user-specified mission duration. The updated version of the model is based on a revised event list including GLEs and sub-GLEs observed between 1973 and 2017, and an improved modeling, which treats the parameters of the fluence spectra as model variables.

The product R.129 models the solar energetic proton peak flux at very high energies. It provides the peak flux-probability curve for a selected energy channel, and the peak flux spectrum at a selected confidence level, both for a user-specified mission duration. The updated version of the model is based on a revised event list and reprocessed GOES/HEPAD fluxes observed between 1986 and 2017. The event occurrence is modeled as a Poisson process, and the peak fluxes are modeled with cut-off power law functions.



The product R.130 is a SEP event catalogue of high energy proton events during 1997 to 2017. It provides detailed information of solar energetic ions and electrons and related solar phenomena.

The product R.138 is a new tool for estimation of high-energy solar heavy ion fluences. It is based on ERNE observations between 1997 and 2015. The tool provides fluence-probability estimates for a user-selected ion species, energy channel, and mission duration. The energy range and number of channels depend on the ion species. The event occurrence is modeled as a Poisson process and the event fluences with cut-off power law functions.

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