

The status of the 4A (Automatized Atmospheric Absorption Atlas) forward model

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This presentation is to summarize the status of the 4A fast line-by-line model, including its operational version (4A/OP). Calculating transmittances, jacobians, radiances and fluxes for a given input of atmospheric and surface conditions is required for both research and operational meteorological or climatological studies. Since its original publication (in the early 80's), the 4A model has been widely involved in such studies as the simulation of high spectral resolution radiances and of their sensitivity to surface and atmospheric variables; the selection of the best possible spectral intervals for the retrieval of atmospheric and surface variables; the investigation of the dynamic range of variation of radiances received at the satellite as a function of spectral and atmospheric variables; the modelling of the Earth radiation budget and simulations of atmospheric cooling rates and radiative forcing; the generation of observation fields (among others the mathematical model of the IASI instrument).

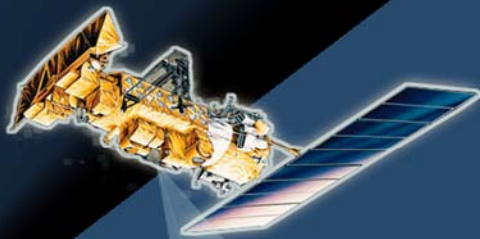
According to new research topics, e.g. related to the new generation of vertical sounders (AIRS/Aqua and IASI/Metop) or limb sounders (Mipas, Ace), the 4A model capabilities have been extended to process limb soundings and take scattering and solar component into account. Performances, computation time will be discussed.

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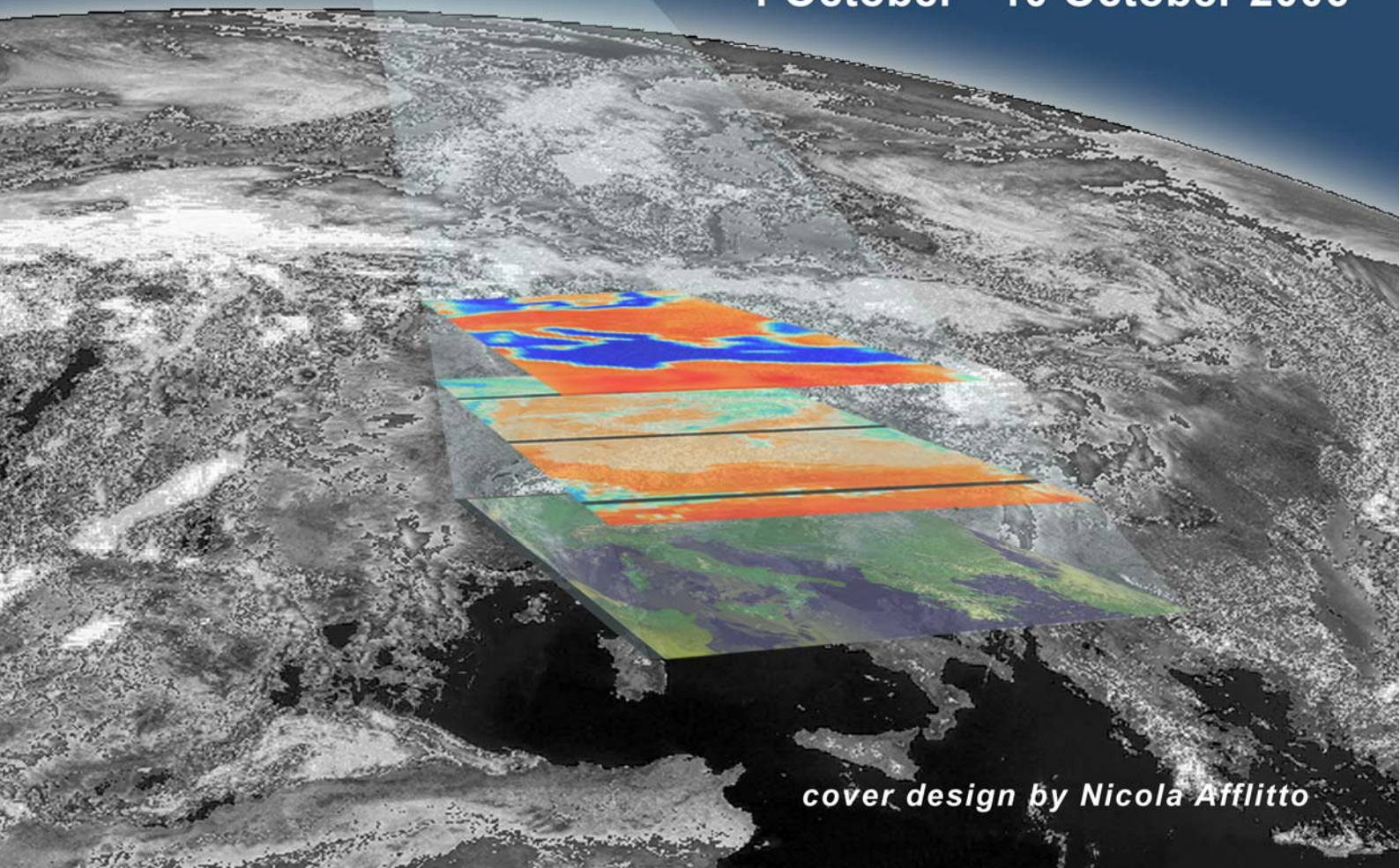
using space-based observations



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