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Simple approximations for the cloud reflection function in the visible and near-infrared and a new cloud property retrieval scheme SLALOM based on optical satellite data

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A new technique for the retrieval of cloud optical and microphysical parameters from optical satellite data during daytime is introduced. The technique is based on simple yet highly accurate approximations of the asymptotic solutions of the radiative transfer theory which have recently been implemented in the forward radiative transfer model CLOUD (see, e.g., www.iup.physik.uni-bremen.de/˜alexk). These approximations enable a solution of the equations of the corresponding backward model, the SimpLe Approximations for cLOudy Media (SLALOM) retrieval, during runtime leading to a very fast computation speed. SLALOM is capable to retrieve the cloud optical thickness, the effective cloud droplet radius, the liquid and ice water paths as well as the particle absorption length. The new radiative transfer scheme will be presented along with first case studies and results of a validation based on comparisons with the MODIS standard cloud product.