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## The Surface Energy Balance System (SEBS) for estimation of turbulent heat fluxes

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**Abstract.** A Surface Energy Balance System (SEBS) is proposed for the estimation of atmospheric turbulent fluxes and evaporative fraction using satellite earth observation data, in combination with meteorological information at proper scales. SEBS consists of: a set of tools for the determination of the land surface physical parameters, such as albedo, emissivity, temperature, vegetation coverage etc., from spectral reflectance and radiance measurements; a model for the determination of the roughness length for heat transfer; and a new formulation for the determination of the evaporative fraction on the basis of energy balance at limiting cases. Four experimental data sets are used to assess the reliabilities of SEBS. Based on these case studies, SEBS has proven to be capable to estimate turbulent heat fluxes and evaporative fraction at various scales with acceptable accuracy. The uncertainties in the estimated heat fluxes are comparable to in-situ measurement uncertainties.

**Keywords:** Surface energy balance, turbulent heat flux, evaporation, remote sensing

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