Parameter estimation for a detailed atmosphere-soil-vegetation model including fog deposition onto vegetation (SOLVEG) by inverse optimization

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SOLVEG is a one-dimensional multilayer atmosphere-soil-vegetation model including fog deposition onto vegetation. However the complexity of the processes described by SOLVEG involves the use of many parameters not always readily available. We describe how an inverse parameter estimation algorithm, based on the Global Multi-level Coordinate Search (GMCS), coupled to SOLVEG can be used to determine model parameters. Focusing on the soil hydraulic parameters, which typically suffer from large uncertainty, we applied this inverse GMCS procedure to optimize such parameters from top soil water content time series measured in a laurel cloud forest of the Garajonay National Park (Canary Islands, Spain).