

Support Vector Regression for Retrieval of Soil Moisture Using Bistatic Scatterometer Data at X-Band

Authors : Dileep Kumar Gupta, Rajendra Prasad, Pradeep Kumar, Varun Narayan Mishra, Ajeet Kumar Vishwakarma, Prashant K. Srivastava

Abstract : An approach was evaluated for the retrieval of soil moisture of bare soil surface using bistatic scatterometer data in the angular range of 200 to 700 at VV- and HH- polarization. The microwave data was acquired by specially designed X-band (10 GHz) bistatic scatterometer. The linear regression analysis was done between scattering coefficients and soil moisture content to select the suitable incidence angle for retrieval of soil moisture content. The 250 incidence angle was found more suitable. The support vector regression analysis was used to approximate the function described by the input-output relationship between the scattering coefficient and corresponding measured values of the soil moisture content. The performance of support vector regression algorithm was evaluated by comparing the observed and the estimated soil moisture content by statistical performance indices %Bias, root mean squared error (RMSE) and Nash-Sutcliffe Efficiency (NSE). The values of %Bias, root mean squared error (RMSE) and Nash-Sutcliffe Efficiency (NSE) were found 2.9451, 1.0986, and 0.9214, respectively at HH-polarization. At VV- polarization, the values of %Bias, root mean squared error (RMSE) and Nash-Sutcliffe Efficiency (NSE) were found 3.6186, 0.9373, and 0.9428, respectively.

Keywords : bistatic scatterometer, soil moisture, support vector regression, RMSE, %Bias, NSE

Conference Title : ICRS 2015 : International Conference on Remote Sensing

Conference Location : Osaka, Japan

Conference Dates : October 08-09, 2015