April 2002 magnetic storms: a comparison of the incoherent scatter radars data and the upper atmosphere model results

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The experimental data on Ne, Ti and Te obtained by seven incoherent scatter radars (ISR at Arecibo, Irkutsk, Kharkov, Millstone Hill, Tromse, Svalbard and Sondrestrom) during April 15-20, 2002 have been compared with the corresponding Upper Atmosphere Model (UAM) results.

A comparison have been made for three height levels situated near 250, 350 and 450 km. The model calculations have been performed at three variants: 1) using MSISE2000 neutral composition and temperature data; 2) fully self-consistently with the theoretical neutral composition and temperature results obtained starting from MSISE2000 as an initial condition; 3) the same as in 2) but starting from the steady state theoretical thermosphere solution used as an initial condition at April 15, 2002.

In the most of cases the experimental data lie between the values calculated in the first and third variants of the model calculations. The best agreement between the ISR and UAM data takes place for the third variant of calculations and the worse one – for the first variant. The differences between the variants 2 and 3 of calculations are significant only for the first two quiet days (April 15 and 16). For disturbed periods starting from April 17 the model results in the variants 2 and 3 are very close and differ significantly from the variant 1 results.

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