



Calculations of key magnetospheric parameters using the isotropic and anisotropic SPSU global MHD code

Andrey Samsonov, Evgeny Gordeev, and Victor Sergeev

St. Petersburg State University, St. Petersburg, Russian Federation (a.samsonov@spbu.ru)

As it was recently suggested (e.g., Gordeev et al., 2015), the global magnetospheric configuration can be characterized by a set of key parameters, such as the magnetopause distance at the subsolar point and on the terminator plane, the magnetic field in the magnetotail lobe and the plasma sheet thermal pressure, the cross polar cap electric potential drop and the total field-aligned current. For given solar wind conditions, the values of these parameters can be obtained from both empirical models and global MHD simulations. We validate the recently developed global MHD code SPSU-16 using the key magnetospheric parameters mentioned above. The code SPSU-16 can calculate both the isotropic and anisotropic MHD equations. In the anisotropic version, we use the modified double-adiabatic equations in which the T_{\perp}/T_{\parallel} (the ratio of perpendicular to parallel thermal pressures) has been bounded from above by the mirror and ion-cyclotron thresholds and from below by the firehose threshold. The results of validation for the SPSU-16 code well agree with the previously published results of other global codes. Some key parameters coincide in the isotropic and anisotropic MHD simulations, but some are different.