Global heliospheric model of ionization states of C, N, O, Mg, Si, S carried by the solar wind

S. Grzedzielski (1), **M. Wachowicz** (1), M. Bzowski (1), V. Izmodenov (2)

(1) Space Research Centre PAS (stangrze@cbk.waw.pl, martaw@cbk.waw.pl, bzowski@cbk.waw.pl), (2)Lomonosov Moscow State University

A global heliospheric model of spatial distribution of multiply ionized C, N, O, Mg, Si, S atoms carried by the solar wind is developed basing on observed inner heliosphere abundances and subsequent ionic charge evolution due to relevant atomic processes (radiative and dielectronic recombination, charge exchange with neutrals, collisional and photonic ionizations, Coulomb scattering). The background distributions of the ion-electron plasma and neutral hydrogen atoms in supersonic solar wind, inner heliosheath and distant heliospheric tail are based on a gasdynamic model with the Monte-Carlo treatment of neutral populations as developed by V. Izmodenov and D. Alexashov (Astron. Lett. 29 (2003) 58-63). Depending on the (unknown) ratio s of efficiency of heavy ion energy losses by collective plasma processes to efficiency of Coulomb energy losses, the heavy coronal ions may, or may not, survive in highly ionized states to large heliocentric distances (˜thousands of AU in the heliotail). The model predicts that small values of s should result in (1) measurable fluxes of keV/n ENAs of mentioned species produced by neutralization of ions and (2) specific soft X-ray emission pattern of the inner heliosheath and tail regions. Observational detection of such effects may offer new means to study the distribution and physical processes in distant heliospheric plasmas.