



## **The role of collisions in the acceleration of the slow solar wind: origin of the helium ions at solar maximum**

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At solar maximum, the slow solar wind presents an enhanced helium abundance compared to solar minimum (Aellig et al., 2001; Kasper et al., 2007, 2012). Sanchez-Diaz et al. (2016) found that the yearly average of helium abundance in the slow solar wind is very well correlated with the yearly average in the proton mass flux right above the transition region. This correlation is especially remarkable for the very slow solar wind ( $V < 300$  km/s), where the proton flux is especially high. We hypothesized that the helium abundance might be enhanced due to a non-negligible amount of Coulomb collisions between hydrogen and helium when the proton mass flux is so elevated (5 times bigger than at solar minimum and one order of magnitude bigger than in the fast solar wind).

To explore the role of H to He collisions in the acceleration of He ions, we input the proton temperature and expansion factor profiles resulting from the combination of a Potential Field Source Model (PFSS) and a 1D hydrodynamic solar wind model described in Pinto et al. (2009) into a collisional two fluid model. The model assumes that there is no heating for the helium ions in the very slow solar wind. We evaluate the possible role of Coulomb collisions on the escape of He for a number of different geometries and boundary conditions.