INJECTION AND ACCELERATION OF HE^{+} AND HE^{++} AT QUASI-PARALLEL INTERPLANETARY SHOCKS

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In the energy range of 85-280 keV the abundance ratio of He+ to He++ shows large enhancements from $\sim$ 0.1 to 1 related to the passage of ME driven interplanetary travelling shocks (Klecker et. al., this Conference). In events with large enhancements the energy spectrum of He^{+} exhibits a super-thermal tail. A possible source for the super-thermal population are pickup He+ ions, accelerated at the interplanetary shock. Furthermore, the super-thermal He^{+}/He^{++} ratio at shock associated events is found to be anti-correlated with both, solar wind velocity and solar wind temperature. This apparent anti-correlation could be caused by several effects. Firstly, the flux of pickup He+, being regarded as a source of super-thermal He^{+}, could decrease with increasing solar wind velocity. Or, secondly, the injection and acceleration efficiency of both, He^{+} and He^{++} depend on the solar wind velocity and/or solar wind thermal velocity. We performed 1D hybrid simulations of quasi-parallel shocks where solar wind He^{++} and pickup He^{+} ions are included self-consistently. The dependence of the injection and acceleration efficiency on solar wind velocity is investigated.