VARIATION OF ENERGETIC HE^{+}, HE^{2+} AND HEAVY IONS ACROSS CO-ROTATING INTERACTION REGIONS

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The variation of He^{+} and He^{2+} and the relative abundance of various ion species across co-rotating interaction regions (CIR) have been studied with ACE SEPICA and ULEIS. The He^{+}/He^{2+} ratio increases consistently from the start of the event towards the end of the CIR, whereas the absolute flux of the energetic ions usually reaches a maximum close to the beginning of the event. Because of the co-rotation of the CIR the spacecraft is magnetically connected to the compression region and the reverse shock at a distance from the sun that increases with time across the CIR. Therefore, the increasing He^{+}/He^{2+} ratio can be interpreted as an increase of the relative importance of the interstellar gas over the solar wind as a source for the observed energetic ions. However, in order to treat the relative contributions of the two sources quantitatively, differences in the transport must be taken into account. Therefore, we will compare the variation of the He^{+}/He^{2+} ratio with the variations of the abundance ratios of several ion species with different rigidities and discuss these variations in terms of transport effects. Simultaneously, we can derive relative acceleration efficiencies for these species.