



The solar wind Quasi-Invariant observed by Stereo A and B at solar minimum 2007 and comparison with two other minima

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The solar wind quasi-invariant (QI) is defined as the ratio of the solar wind magnetic energy density to the plasma kinetic energy density, i.e., the inverse square of the Alfvén Mach number. Previous work has found this quantity to be a good proxy for solar activity, correlating very well with the solar sunspot number. It has the advantage of being locally determined from in situ observations. Using Stereo-A and B and Wind data we obtain the distribution of QI during the current solar activity minimum (March - December, 2007). (1) We inquire if this minimum is indeed weaker than previous ones by comparing its QI distribution with those during two other solar activity minima. (2) In all three solar cycle minima considered we find that the QI-distributions are well represented by a log-normal distribution and we give the respective mean and standard deviations. These values are used in comparing the QI's over the three solar minima. The main result is that the recent minimum in 2007 was indeed weaker than previous ones.