



Variations of the magnetic and plasma kinetic energy densities

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A quantity called the quasi-invariant (QI), defined as the ratio of the magnetic energy density to the plasma kinetic energy density, has been found to be a good proxy for solar activity. This quantity was found to correlate strongly with the sunspot number ($cc > 0.9$), a correlation which holds not only for observations at 1 AU but also at Venus at 0.72 AU. However, no extensive observations on the QI index were reported in the inner heliosphere. Using the entire Helios data set we examine QI as a function of radial distance in the range 0.3–1 AU. A further new aspect is that we factor in the contribution of He⁺⁺ ions to this parameter. Finally, the difference between QI values in the ambient solar wind, and those obtained during magnetic cloud events are explored and discussed.