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The presence of solar wind meso-scale transient structures are mainly consequences of solar activity. In particular, there are two solar processes producing interplanetary structures: (1) Coronal Mass Ejections (CMEs, producing their interplanetary counterpart, called ICMEs) and (2) Coronal Holes (CHs, producing their interplanetary counterpart as a consequence of the interaction between fast and slow solar wind: the Stream Interaction Regions, SIRs). Observed properties of ICMEs and SIRs are determined by their solar sources as well as by several processes that occur during the evolution of the interplanetary plasma from the Sun to the terrestrial space environment. Furthermore, the interest in these properties resides in their importance to determine the level of solar-terrestrial coupling.
In this report, we present a statistical analysis of the properties of ICMEs and SIRs at 1 au. Plasma and interplanetary magnetic field (IMF) data are studied using observations from the SWEPAM (Solar Wind Electron, Proton & Alpha Monitor) and MAG (Magnetometer) instruments aboard the ACE (Advanced Composition Explorer) spacecraft. In particular, we study the time range from the beginning of 1998 to the middle of 2017. The study aims to describe the magnetic direction inside ICMEs and SIRs, in comparison with the expected orientation for a Parkerian solar wind (orientation given by Parker´s spiral). Moreover, we will present a comparison of this analysis for maximum and minimum solar phases.
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