



Contribution ID: 511

Type: Poster

How the shape of coronal holes influences the high-speed stream peak velocity at Earth

Tuesday, 7 September 2021 09:39 (13 minutes)

Coronal holes (CHs) are regions with open magnetic field topology in the solar corona. They are characterized by lower densities and temperatures compared to the ambient solar environment. Further, they are the source regions of high speed solar wind streams (HSSs), which propagate through the interplanetary space. Throughout the years, many authors have performed statistical studies comparing the CH properties and the characteristics of the HSSs at Earth in order to understand their relationship. This topic is of utmost importance for modelling the solar wind environment in interplanetary space as well as for space weather predictions.

In this study, we perform a statistical analysis of a set of 45 CHs during a period of solar minimum activity. We focus on the geometrical shape of the CHs and we divide our sample in different groups based on various geometrical criteria. We then examine the relationship of each group with the HSS peak velocity at Earth. Our results show that the HSS peak velocity in situ is better constrained by CHs of specific properties. We further quantify the geometrical complexity of the CHs by employing two different ways: (a) by defining a ratio of geometrical properties and (b) by calculating their fractal dimension.

Student poster?

Primary authors: SAMARA, Evangelia (Royal Observatory of Belgium and KU Leuven); Dr MAGDALENIC, Jasmina (Solar-Terrestrial Centre of Excellence—SIDC, Royal Observatory of Belgium); RODRIGUEZ, Luciano (Solar-Terrestrial Centre of Excellence-SIDC, Royal Observatory of Belgium); HEINEMANN, Stephan G. (Max-Planck-Institute for Solar System Research); HOFMEISTER, Stefan (stefan.hofmeister@columbia.edu); POEDTS, Stefaan (Center for Mathematical Plasma Astrophysics, Department of Mathematics, KU Leuven, Celestijnenlaan 200B, 3001Leuven, Belgium; Institute of Physics, University of Maria Curie-Skłodowska, Pl. Marii Curie-Skłodowskiej 5, 20-031 Lublin, Poland)

Presenter: SAMARA, Evangelia (Royal Observatory of Belgium and KU Leuven)

Session Classification: Poster Session 3.6

Track Classification: Session 5 - Solar-Terrestrial Relations, Solar Wind, Space Weather and Space Climate