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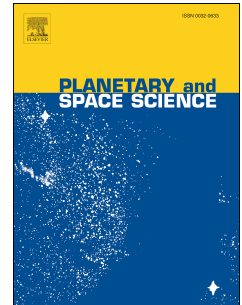
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Space Weather at Planet Venus during the forthcoming BepiColombo flybys

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Abstract: The BepiColombo (BC) Mission which will be launched in 2018, will include during its Cruise Phase two flybys of Venus and five Mercury flybys. It will then enter a one Earth year orbit about Mercury (with a possible one-year extension) during which two spacecraft, one provided by ESA (MPO) and one provided by JAXA (MMO), will perform both autonomous and coordinated observations of the Hermean environment at various separations. The measurements will take place during the minimum of solar cycle 24 and the rise of solar cycle 25. At the start of the minimum of solar cycle 23, four major flares, each associated with the production of MeV particle radiation and CME activity occurred. Predictions of the HAF v.2 model of the arrival of particle radiation and a travelling shock at Venus on 6 December 2006 were verified by in situ measurements made aboard Venus Express (VEX) by the ASPERA 4 instrument. Interplanetary Scintillation observations, as well as the ENLIL 3-D MHD model when employed separately or in combination, enable the making of predictions of the solar wind density and speed at various locations in the inner heliosphere. Both methods, which outdate HAFv.2, are utilized in the present paper to predict (retrospectively) the arrival of the flare related, interplanetary propagating shock recorded at Venus on 6 December 2006 aboard VEX with a view to putting in place the facility to make very reliable space weather predictions for BC during both its Cruise Phase and when in the Hermean environment itself. The successful matching of the December 2006 predictions with in situ signatures recorded aboard Venus Express provide confidence that the predictive methodology to be adopted will be appropriate to provide space weather predictions for BepiColombo during its Venus flybys and throughout the mission.

Keywords: *Interplanetary Scintillation technique; ENLIL Modelling; Coronal Mass Ejections; Mercury; BepiColombo Mission.*

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