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## Improving the Empirical Solar Wind Forecast (ESWF) model

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The empirical solar wind forecast (ESWF) model is an ESA service to forecast the solar wind speed at Earth with 4 days lead time. The model uses a simple empirical relation between the area of coronal holes (CHs) as measured in meridional slices in EUV at the Sun and the in-situ measured solar wind speed at 1 AU (Vršnak, Temmer, Veronig, 2007). The relation has the drawback that Gaussian type speed profiles are produced as the CH rotates in and out of the meridional slice. With adaptations to the ESWF algorithm we aim to improve the precision of the ESWF speed profile by implementing compression and rarefaction effects occurring between SW streams of different velocities in the interplanetary space. By considering the propagation times for plasma parcels between the Sun and Earth and their interactions, we achieve the asymmetrical shape of the speed profile that is characteristic of high-speed streams (HSS). We present a statistical analysis for the period 2012 - 2019 showing that our adaptations improve the ability to predict HSS speed profiles as well as smaller structures with higher precision.