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Understanding the origins and properties of the solar wind

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The Sun —like many stars —possesses a wind that streams outwards to fill the heliosphere. Observations of the solar wind show that it is divided into “fast” and “slow” wind streams, whose variabilities, compositions and apparent origins are different. The origin of the slow solar wind remains enigmatic, hampering efforts to predict conditions in near-Earth space. Here we describe ongoing modelling efforts to understand the origin of the slow component of the wind, and the mechanisms responsible for its properties. These involve global modelling of the Sun’s magnetic field as well as local models large-scale, adaptive-mesh, magnetohydrodynamic simulations of the solar atmosphere.

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