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The solar wind flux and acceleration height as seen by SOHO/SWAN and LASCO/C2

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We present an update of the SOHO/SWAN H Lyman-alpha data to cover the 1996-2009 time interval. A forward model applied to the intensity maps provides the latitude and time dependence of the interstellar H ionisation rate over more than a full solar cycle. This ionisation, being almost entirely due to charge-exchange with solar wind ions, reflects closely the solar wind flux. We show that the solar wind latitudinal structure during the present solar minimum is strikingly different from the previous minimum, with a much wider slow solar wind equatorial belt which persists until at least the end of 2008.
After calibration of our 3D ionisation rates on OMNI in-ecliptic data, we compare the resulting solar wind fluxes with the synoptic LASCO/C2 electron densities at 6 Rs. The two time-latitude patterns are strikingly similar over all the cycle, high (resp. low) H ionisation and 6Rs coronal densities tracing the slow (resp. fast) solar wind. This is because the H ionisation reflects the solar wind flux and speed, while the coronal density reflects at which altitude occurs the acceleration. The comparison between the two minima of activity suggests that the high latitude fast wind accelerates at larger distance from the Sun surface during the current minimum compared to the previous one. This difference, potentially linked to the magnetic field decrease or(and) the coronal temperature decrease should be reproduced by solar wind expansion models.