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The active Sun and its implication for the heliosphere
oral preferred

Visibility of Active Region emergence in magnetogram data

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The emergence of a new Active Region (AR) on disk is typically detected via analysis of full-disk continuum images or magnetograms. The presence of an asymmetry in the longitudinal distribution of new emergences as deduced from continuum images is well known (both from ground based and SOHO/MDI data). It can be explained as due to the centre-to-limb variation of the visibility of small sunspots [eg Dalla et al 2008], for example due to the Wilson effect [Watson et al 2009]. Here we analyse whether a similar asymmetry (and consequent strong centre-to-limb variation of visibility threshold) also exists for the detection of new AR emergences in magnetograms. We use the NSO Kitt Peak magnetogram dataset, which covers the time range between 1974 and 2003 with its 512 channel magnetograph and the more recent spectromagnetograph. We automatically detect new emergences, analyse their distribution on the solar disk and derive parameters of the visibility functions for line of sight magnetograms.