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InSAR measurement of interseismic strain in areas of low coherence : example across the Haiyuan fault (Gansu, China) using a local InSAR adaptive range filter

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In this study, we measure the interseismic deformation across the western Haiyuan fault. This fault is a major left-lateral fault at the north-eastern edge of the Tibetan plateau. Our aim is to better constrain its present mechanical behavior, at the origin of two M˜8 earthquakes in 1920 and 1927, and along which a seismic gap with high potential seismic hazard has been identified. The gap is covered by ERS and Envisat data along three adjacent tracks. Along the two easternmost tracks, a steep velocity gradient has been observed across the fault, consistent with a left-lateral slip at a rate of 6.3ś2 mm/yr below a small apparent locking depth (<2 km), which may be indicative of transient superficial creep or related to a weak fault zone (Cavalié et al. 2008). The western track has not yet been studied as it covers a very high mountainous area, which introduces strong geometrical decorrelation. In this study, we focus on this track and propose a new InSAR adaptive range filter algorithm. Generally, the range interferometric filter assumes a constant slope terrain and the new generation of filters, even if they shift bandwidth with respect to the terrain slope, perform a spectral cul for the whole range line. In our approach, a sliding moving window is used to perform a local adaptive range filter. Areas over critical baseline and shadowed areas for

example can be detected and masked with this approach. During the process, an optimisation is performed to perfectly align the local common bandwidths. Preliminary results show an improvement of the coherence over mountainous area under study, making it possible to exploit the InSAR data archive in this area.