

# Wavelet analysis of Active Region structure

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Active regions are known to consist of complex magnetic fields, as evinced by both fractal and multifractal studies. In contrast, the Mt. Wilson classification of active regions is relatively simple, yet is useful in predicting the likelihood of flaring events, since it considers the overall geometrical structure of the active region. In particular, neutral lines are especially important in evaluating the likelihood of flare events occurring. Wavelet analysis techniques, in conjunction with edge detection methods are applied to the problem of diagnosing the gross geometrical structure of active region magnetic field. Active region fields are decomposed into their constituent parts using wavelet techniques, and edge detection methods are used to characterize the neutral lines present. A statistical analysis is presented outlining the utility of this approach in automatically generating a Mt. Wilson classification for a given active region.