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Measuring ergodicity and mixing at different scales.

Despite the frequent occurrence of ergodicity and mixing in a wide range of settings, the problem of measuring the properties is still unresolved and there is no universal method for quantifying the phenomena. Moreover, in many situations the phenomena occur on a wide range of scales and as such, modelling accurately continues to be challenging. A multiscale approach based on classical ergodic theoretical concepts is posed here to assess the degree of ergodicity and mixing in fluid flows. The scaling analysis is achieved using wavelets and is introduced with the Haar wavelet. This is joint work with C. Redd, I. Mezic and C. Jones and builds on work of L. Kuznetsov et. al. (Received September 22, 2005)