

**Novel use of a bandwidth measure for  
Vortex Induced Vibrations  
Case Study : the Foinaven dynamic umbilical**

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ABSTRACT : An innovative use of a method to detect Vortex Induced Vibration (VIV) bandwidth in the curvature data of subsea flexibles is presented. The parameter epsilon gives a valuable estimate of the bandwidth of signals such as VIV as a single value which may be used to track the behaviour with time and against other measures such as current speed. The method is conveniently based on a peak counting approach originally formulated by Cartwright and Longuet-Higgins. Low epsilon values close to zero indicate a narrow band process whereas values near unity indicate a broad band process. Comparisons with the alternative kurtosis statistic are also presented. The epsilon measure is shown to have a more useful linear behaviour than kurtosis. Curvature data gathered for different periods in 2000 and 2001 by the monitoring system installed on Foinaven Petrojarl IV have been analysed. Results from the epsilon technique are confirmed by spectral analysis showing that the epsilon measure provides useful information on the form of VIV on a time varying basis.

*Keywords : Vortex Induced Vibration, VIV, FUMS, epsilon, kurtosis*