

Abstract Submitted
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Response Reconstruction for Traveling Wave Identification HARISH MUKUNDAN, MICHAEL TRIANTAFYLLOU, FRANZ HOVER, Massachusetts Institute of Technology — A large volume of research in vortex-induced vibration (VIV) is focused on elastically mounted rigid cylindrical bodies with much less attention given to flexible cylinders like risers. These risers may encounter a current with both magnitude and direction varying over the span. We consider the problem of obtaining and studying the VIV displacements (both cross-flow and in-line) of such a riser along its entire length, when we are provided with some sensors measuring strains and accelerations. We will build the problem from the fundamental approach of using Fourier series, and evaluate criteria when such a reconstruction is allowed. The method will be applied to data from a set of experiments (uniform and linearly sheared profiles) conducted at Marintek wave basin. One feature observed from the experiments is the presence of traveling waves. Various methods for identifying traveling waves will be discussed. The mechanism of energy propagation and the interaction between CF and IL displacements during the process will be discussed.

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