

Abstract Submitted  
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**Understanding Cavitation Intensity through Pitting and Pressure Pulse Analysis** A. JAYAPRAKASH, S. SINGH, J-K. CHOI, G. CHAHINE, Dynaflow Inc. — Cavitation erosion is of interest to the designers of ship propulsion devices because of its detrimental effects. One of the difficulties of predicting cavitation erosion is that the intensity of cavitation is not well predicted or defined. In this work we attempt to define the intensity of a cavitation erosion field through analysis of cavitation induced erosion pits and pressure pulses. In the pitting tests, material samples were subjected to cavitation field for a short duration of time selected within the test sample's incubation period, so that the test sample undergoes plastic deformation only. The sample material reacts to these cavitation events by undergoing localized permanent deformation, called pits. The resulting pitted sample surfaces were then optically scanned and analyzed. The pressure signals under cavitating jets and ultrasonic horns, for different conditions, were experimentally recorded using high frequency response pressure transducers. From the analysis of the pitting data and recorded pressure signals, we propose a model that describes the statistics, which in the future can be used to define the cavitation field intensity. Support for this work was provided by Office of Naval Research (ONR) under contract number N00014-08-C-0450, monitored by Dr. Ki-Han Kim.

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