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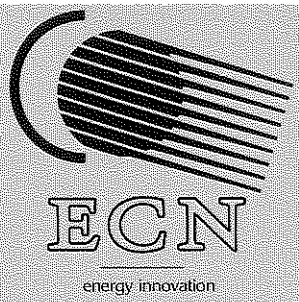

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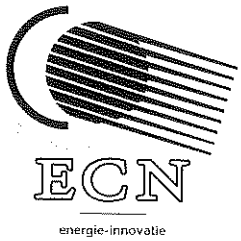
NUMERICAL QUANTIFICATION OF CROSSTALK IN LOAD MEASUREMENTS ON THE DEBRA BLADE

J. HAMELINK
J.J. HEIJDRA
N.J.C.M. VAN DER BORG



Abstract

Mechanical load measurements on wind turbine blades are generally performed using strain gauges on the blades. The strain gauge positions are selected in such a way that a strain gauge bridge designed for the measurement of a certain load shows no or little response to other loads. The response of load signals to loads for which they are not designed is called crosstalk.

A number of strain gauge bridges have been simulated using ANSYS and a model of the DEBRA-blade, put at ECN's disposal by DEWI. The simulated dependencies for the strain gauges at the locations chosen in reference [1] have been compared with the measured dependencies to assess the applicability of such simulations for the prediction of load signals. Furthermore simulations have been performed of strain gauges on different positions to gain information on the sensitivity of the crosstalk effects for the choice of the position.

Due to the large differences in the results of the measurements and simulations it is concluded that, in this case, the simulations would not have led to a reliable choice for the location of the strain gauge bridge. Also no clear preference for the bridges (0°/90° or 45°/135°) to be used for the measurement of the edgewise and flatwise moments could be given.

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