

Adaptive feed-forward control of low frequency interior noise

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Abstrak

This book presents a mechatronic approach to Active Noise Control (ANC). It describes the required elements of system theory, engineering acoustics, electroacoustics and adaptive signal processing in a comprehensive, consistent and systematic manner using a unified notation. Furthermore, it includes a design methodology for ANC-systems, explains its application and describes tools to be used for ANC-system design. From the research point of view, the book presents new approaches to sound source localization in weakly damped interiors. One is based on the inverse finite element method, the other is based on a sound intensity probe with an active free field. Furthermore, a prototype of an ANC-system able to reach the physical limits of local (feed-forward) ANC is described. This is one example for applied research in ANC-system design. Other examples are given for (i) local ANC in a semi-enclosed subspace of an aircraft cargo hold and (ii) for the combination of audio entertainment with ANC.