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Active vibration control for the identification-based model of a circular plate

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An active vibration control system is proposed for suppressing the small amplitude vibration of circular plate. An experimental set-up consists of a hard-walled cylinder with a thin metallic plate at one end. Primary excitation is provided by a low frequency loudspeaker installed centrally at the bottom of the cylinder. The vibrations of the plate are measured by the application of strain sensors and accelerometers. Intelligent materials such as 2-layer piezo disk elements are used as the actuators. For the considered system the OE (Output Error) method of discrete-time model identification for real-time active vibration control have been applied. The mathematical model obtained by this method identification is then employed for the linear pole placement controller design. Numerical simulations describing the attenuation effects are presented and discussed.