

**EVALUATION OF STABILITY MARGIN OF ACTIVE MAGNETIC BEARING  
CONTROL SYSTEM USING SENSITIVITY FUNCTION**

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**ABSTRACT**

Flexible rotors supported by Active Magnetic Bearings (AMBs) have problems with high frequency instabilities called spillover instability. ISO 14839 series provides a standard for AMBs equipped rotors and Part 3 intends to regulate the stability and sensitivity of any eigen modes existing in the rotational speed. The peaks of the sensitivity function become the index for judging stability margin. In this paper, the effect of the total gain and phase lag of the controllers on the sensitivity is evaluated by an experimental system, which is the compressor equipped with active magnetic bearings. We use the centralized control method. The sensor signal of the left and right radial AMBs are divided into parallel and tilting modes. Each of the separated signals is reformed by the different controllers. Regarding the effect of total gain, we measure the sensitivity function when the total gain is varied. Regarding the phase, the filter whose gain is constant but phase lags, is added to each controllers, and then the sensitivity function is measured.