소형 정밀 왕복동 기기용 선형 탄성 베어링 고유 모델(KIMM-LFB)의 설계 및 해석

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Design and analysis of a newly devised linear flexure bearing(KIMM-LFB) for small precision reciprocating machines

Abstract : A newly devised linear flexure bearing (KIMM-LFB) for reciprocating machines is disclosed having improved reliability for long life. KIMM-LFB is an integrated device comprising a axially moving diaphragm with circumferentially arranged arc-shaped flexure blades secured between rim and hub spacers, which turn out to have higher radial stiffness and lower Von-Mises peak stresses than the one with circumferential tangent cantilever flexure blades. It is expected for KIMM-LFB to play a key role in designing long life, special purpose reciprocating machines such as spacecraft borne cryogenic refrigerators (cryocoolers) by providing frictionless, non-wearing, linear movement and radial support for the machines as well as a gas clearance seal by maintaining extremely tight clearances between piston and cylinder.

구형좌표계에서 음향 홀로그래피의 적용

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The Implementation of Spherical Acoustical Holography

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Key Words : spherical acoustical holography, power filtering, noise source identification

Abstract : In this presentation, a power-based spatial filtering procedure with application to spherical acoustical holography is presented. Planar and cylindrical holography are the most widely used amongst the various nearfield acoustical holography techniques. However, when the geometry of a source is similar to a sphere, spherical holography may yield better results than other types of holography since there are no errors due to truncation of the sound field in the spherical case. Spatial filtering affects the accuracy of spherical acoustical holography critically, especially in the case of back projection. Thus spatial filtering is essential for successful application of spherical holography. In the present work, various filtering methods were evaluated in simulations using sound pressure fields of different types superposed with different levels of random spatial noise. It was found that a procedure based on eliminating spherical harmonic coefficients that do not contribute significantly to the total sound power of the source gave the best results on average of the different procedures considered here. Spherical holography procedures were also verified experimentally. Reliable results were obtained using power filtering algorithm. Thus it was concluded that spherical holography combined with power filtering may