

Analysis of geometry related constraints of minimum effort active noise control system

ABSTRACT

This paper presents an analysis of the geometry-related constraints of a single-input single output (SISO) minimum effort active noise control system with feedback inclusion architecture which includes the feedback path in the controller formulation. Realisation of this type of minimum effort controller imposes an infinite gain control (IGC) requirement for certain geometrical arrangements. In the investigation into these geometrical arrangements with fixed primary and secondary source locations, the IGC locus is found to be two circles occupied by the detector and observer respectively in three dimensions. Varying the minimum effort parameter term has the effect of moving these two circles closer or away from each other, hence varying their location and radii. As a result, the minimum effort parameter, apart from constraining the control signal has a potential of overcoming the IGC constraints for a fixed geometrical arrangement.

Keyword: Minimum effort parameter; Infinite gain control; Distance ratio