ACOUSTICS2008/272
The effect of mechanical elasticity on the surface impedance of a organic/inorganic composite aerogel

Winny Dong[a], Wayland Dong[b], Tanya Faltens[a], Elizabeth Scott[a] and Travis Thompson[a]
[a]California State Polytechnic University, 3801 West Temple Avenue, Chemical and Materials Engineering, Pomona, CA 91768, USA
[b]Veneklasen Associates, 1711 Sixteenth Street, Santa Monica, CA 90404, USA

Previous reports on the acoustical properties of monolithic silica aerogels have indicated that although the material's high porosity, pore tortuosity, and surface area contribute to a low sound velocity in the material, the rigid matrix of the aerogel exhibit a high reflection coefficient. Work by Forest et al. and others have shown that using granules instead of silica aerogel monoliths, the acoustical properties can be significantly enhanced. We report the acoustic properties of a polydimethylsilicate (PDMS)/silica composite aerogel that has both high surface area and a mechanically elastic matrix. Both monoliths and granules are studied. The surface impedance (at normal incidence) as a function of open porosity, pore size distribution, surface area, elasticity, and granule size will be reported.