



# Negative-Stiffness Vibration Isolation Gaining Popularity As The Need For Refined Imaging With Laser/Optical Systems Increases

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Laser and optical systems, whether used in academic labs or industry, are very susceptible to vibrations from the environment and these instruments frequently need vibration isolation. When measuring a very few angstroms or nanometers of displacement an absolutely stable surface has to be maintained upon which to rest the instrument. Any vibration, coupled into the mechanical structure of the instrument, will cause vertical noise and fundamentally an inability to measure these kinds of high resolution features.

Traditionally, large air tables have been the isolators used for laser/optical equipment. The ubiquitous passive-system air tables, adequate up until a few years ago, are now being seriously challenged by the need for more refined imaging requirements. Bench top air systems, however, provide limited isolation vertically and very little isolation horizontally. Yet, Scanning Probe Microscopes (SPMs), for example, have vibration isolation requirements that are unparalleled in the laser/optical world. The vertical axis is the most sensitive for most SPMs. They can also be quite sensitive to vibrations in the horizontal axes. In order to

achieve the lowest possible noise floor, on the order of an Angstrom, vibration isolation must be used. Negative-Stiffness Mechanism (NSM) isolators have the flexibility of custom tailoring resonant frequencies vertically and horizontally, providing increased isolation performance for SPMs over air tables.