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Damping pads for accelerator and beamline components

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The accelerator and beamline components of the APS have stringent vibration criteria in order to meet the beam stability requirements. For instance, the vibration amplitude of the storage ring magnets is restricted to 0.11 micron RMS over 4-50 Hz frequency range. Damping pads, consisting of thin viscoelastic sheets sandwiched between stainless steel plates, have been designed for passive vibration damping. Results presented in this paper show that the damping pads under the storage ring girders reduced the magnification factor, Q, from approximately 100 to 10. The broad band RMS motion was damped by more than a factor of 5, to less than 0.1 micron. Preliminary tests for reducing the vibration level of a monochromator by placing dampings pads under its support table have also been promising. Test data for damping and creep properties of the viscoelastic materials used in the damping pads are also presented.