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Temperature Dependent Cryogenic Loss Measurements of Ti-doped GeO2 thin films

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A cryogenic mechanical loss measurement setup built at Stanford University can operate from room temperature down to at least 12K. The experimental method described is based on actuation of a Si oscillator and measurement of its quality factor (Q-factor). The film's mechanical loss can be obtained using the Q-factors of coated and uncoated resonators. Experimental results obtained for several Ti-doped GeO2 films deposited on a double paddle oscillator (DPO) with the resonant frequency of c.a. 6 kHz and temperature range 12 – 300 K are presented and discussed. Some preliminary results on micro resonators for frequency dependent measurements of the coatings in LIGO sensitive region (100 Hz –300 Hz) are also presented.

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