



Contribution ID: 81

Type: talk

## Metrology open issues in GeNS measurements

*Wednesday, 19 May 2021 06:45 (15 minutes)*

The Gentle Nodal Suspension (GeNS) has become the most common technique for measuring coating mechanical dissipation, showing an unprecedented result repeatability on disk shaped substrates. GeNS gives the possibilities to perform measurement so accurate that it is possible to follow even tiny changes in the sample mechanical behavior. The high level of sensitivity makes some new systematic effect to be relevant, posing metrological issues which are currently unsolved.

Sample curvature changes caused by non symmetrical coatings and post-deposition thermal treatments, and changes of few degrees in sample temperature, produce mode frequency shifts which overlap to the ones given by the coating itself. This overlapping spoils the accuracy of dilution factor measurement and elastic parameters estimation.

Dissipation of silicon and sapphire substrates, commonly used in cryogenics measurements, are dominated for most of the temperature span by thermoelastic damping. Changing in the thermoelastic dissipation is shown to be induced by coating deposition. Since coating loss angle is measured by difference, this effect gives a systematic error in assuming bare substrate not altered by deposition. Lastly both the thermoelastic damping shift, as well as the dishomogeneity of the coating at the sample edge, can give systematics in trying to disentangle different bulk and shear loss angles. A description of these open issues will be given and a path for solutions will be presented.

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**Session Classification:** Coating thermal noise Workshop

**Track Classification:** Workshops: Coating thermal noise workshop