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Bismuth-Gold absorber for large area TES spiderweb bolometers

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Large area spiderweb bolometer of about one centimetre diameter are required for matching multimode or quasi-optical cavities in microwave antenna for CMB measurements as proposed for the Large Scale Polarisation Explorer balloon borne sky survey at 140, 220, 250 GHz. Possible applications at low frequencies, 40 GHz or less, in single mode are also foreseen. The main drawback of such large absorber is the achievement of an optimal trade-off among the thermal properties, like fast internal thermal diffusivity, heat capacity and milli-second recovery time and EM characteristics, like the matching impedance and EM power dissipation. In parallel with standard micropatterned gold film absorber deposited onto silicon nitride membrane, we have tested the Bismuth Gold in order to reduce the heat capacity even if with an increase of resistivity. Films of Bismuth Gold may have low resistivity under application of a proper post-production thermal cycle. We present the fabrication method of Bismuth Gold films for our microwave absorbers and the bolometer characterization at low temperature.

Less than 5 years of experience since completion of Ph.D

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Student (Ph.D., M.Sc. or B.Sc.)

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