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Seebeck and SBS studies on buried amorphous carbon channels in Diamond

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Recent studies has shown that buried amorphous carbon layers in diamond created by ion implantation have Seebeck behaviours that can be attributed to the graphitic assembly of the carbon bonds. The extent of the sp² carbon network is clearly attributed to the fluence and annealing cycle used. In these buried layers we observe the shift of the minimum of the Seebeck voltage amplitude to higher temperatures compared to free standing graphite. The contribution to the Seebeck voltage due to the phonon-drag effect is well understood in graphite. In our system we have a buried graphitic channel surrounded by a diamond matrix. This unique system suggest that electron-phonon interactions at the boundaries of the buried interfaces have an influence on the Seebeck behaviour. We show in parallel unique signatures from the elastodynamic response of the system as measured by Surface Brillouin scattering for a hard-soft-hard system.

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None

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