Abstract Submitted
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Charged nanodiamonds in a Paul trap[1] ERIK STREED, Griffith University — Colloidal nanodiamonds were ionized with atmospheric electrospray and loaded into a Paul trap. Fluorescence from atom-like NV0 and NV- colour centres has been observed. The very low intrinsic absorption of bulk diamond is favourable for reducing the heating of cooled, trapped, nanodiamond ions from the surrounding blackbody radiation of the trapping apparatus. The isolated environment of the ion trap is also favourable for in-situ modification of nanodiamond to reduce absorption inducing defects through either physical or chemical processes. The presence or intentional introduction of high luminescence atom-like colour centre defects such as NV or SiV offer the prospect of direct laser cooling in nanodiamonds with low emissivity. Such laser cooled nano-ions are of interest for sympathetically cooling ions of similar charge/mass ratios that lack closed optical transitions, such as large biomolecules.

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