

## **Influence of radiation damage on ruby as a pressure gauge**

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This study tackles the question if ruby crystals, irradiated with energetic heavy ions, can still be used as reliable pressure sensors. The problem is linked to novel irradiation experiments, exposing pressurized samples to swift heavy-ion beams. In order to test and quantify a possible influence of radiation damage on the laser-induced fluorescence lines of ruby ( $\text{Al}^2\text{O}^3:\text{Cr}^{3+}$ ), small crystals were exposed to different heavy ions (Xe, Au, and U) with kinetic energies of several giga-electron volt at ambient as well as high-pressure conditions. With increasing fluence ( $\text{ions}/\text{cm}^2$ ), the  $R_1$  and  $R_2$  lines shift both to lower wavelengths which leads to an underestimation of the pressure. An empirical correction term  $\_$  is proposed to include the irradiation damage effect into the commonly employed ruby calibration scale.