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## Investigation of hyperfine interactions in GdCrO<sub>3</sub> perovskite oxide using PAC spectroscopy

Investigation of hyperfine interactions in GdCrO<sub>3</sub> perovskite oxide using PAC spectroscopy

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### Abstract

Perturbed angular correlation (PAC) measurements have been carried out in the anti-ferromagnetic GdCrO<sub>3</sub> perovskite oxide using <sup>111</sup>In (<sup>111</sup>Cd) and <sup>181</sup>Hf(<sup>181</sup>Ta) nuclear probes. The radioactive parent nuclei <sup>111</sup>In and <sup>181</sup>Hf were introduced in the compound through a chemical process during sample preparation. The PAC measurements were carried out in the temperature range 20-300 K. Measurements with the <sup>181</sup>Ta indicated a unique quadrupole interaction above 170 K and a combined electric quadrupole and magnetic dipole interactions below this temperature. The observed interactions were assigned to the probe nuclei substituting Cr sites in GdCrO<sub>3</sub>. Measurements with <sup>111</sup>Cd showed two quadrupole interactions. Only one of the fractions however, showed a combined electric and magnetic interaction in the temperature range 20-170 K which was assigned to <sup>111</sup>Cd probe substituting Cr site. The other fraction was attributed to the Gd site. The present results are compared with those of LaCrO<sub>3</sub> and NdCrO<sub>3</sub>.

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