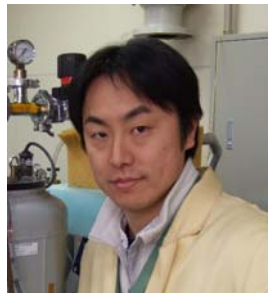
Novel Magnetic Ordering in Neptunium Dioxide NpO_2

—Experimental confirmation of magnetic octupolar ordering —



In collaboration with the Institute of Materials Research in Tohoku University

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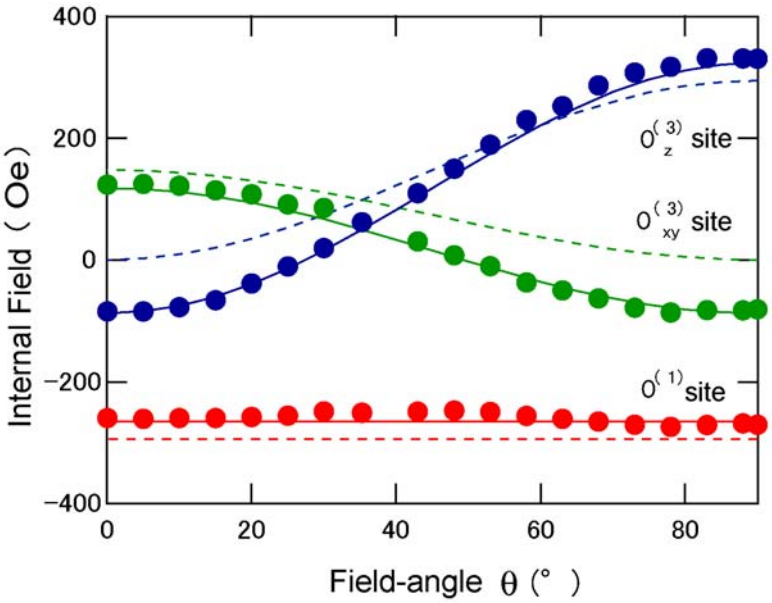
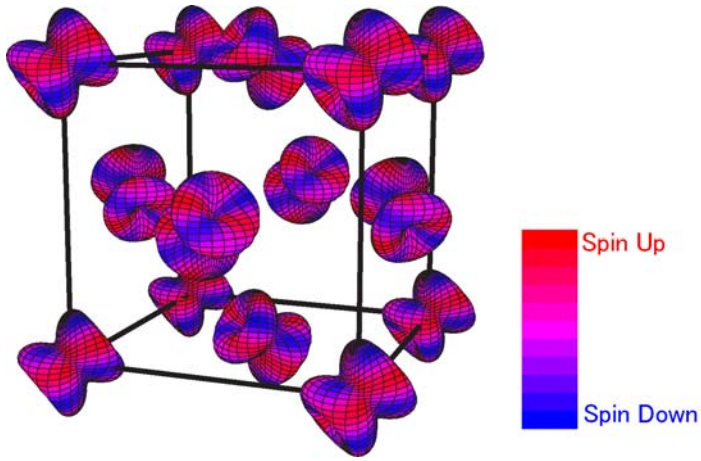
Novel magnetic-octupolar ordering of Np 5f-electrons has been confirmed by using the NMR technique.

This finding reveals that it is possible that the octupolar degrees of freedom, characteristic of f electrons, may govern the physics of actinide compounds.



Field-angle dependence of the internal field at O sites in NpO_2. The solid and dotted lines are the results of model calculations with and without the contribution from the field-induced magnetic octupolar ordering, respectively.

The result of the experiment gave good agreement with the octupolar ordering model that had been obtained from microscopic calculations by Dr. Kubo and Dr. Hotta (JAEA).



Magnetic-octupolar ordering state of NpO_2 calculated by Dr. Kubo and Dr. Hotta (JAEA). Red and Blue colors on the surface indicate the weight of up- and down-spin states.

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