

This Week's Citation Classic

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Löbner K E G, Vetter M & Hönig V. Nuclear intrinsic quadrupole moments and deformation parameters. *Nucl. Data Tables A* 7:495-564, 1970.
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In this paper all available experimental data were collected from which deformation parameters or intrinsic quadrupole moments can be deduced. Averaged values for the intrinsic quadrupole moment and deformation parameters of deformed nuclei in the rare-earth and actinide region are presented for each isotope. [The SCI® indicates that this paper has been cited over 150 times since 1970.]

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"I think there were mainly two reasons why I wrote this paper. First, after I had finished the papers 'Systematics of absolute gamma-ray transition probabilities in deformed odd-mass nuclei'¹ and 'Systematics of absolute transition probabilities of K-forbidden gamma-ray transitions,'² I became interested in surveying experimental data. Another reason why I started this compilation was that I did not have many possibilities to do experimental work at the University of Freiburg.

"I was working at the physics department of the University of Freiburg as *wissenschaftlicher* assistant. This was my first position after finishing my thesis at the University of Amsterdam, the Netherlands. The two coauthors of this compilation, M. Vetter and V. Hönig, were busy with their doctoral degrees at that time. They are both working in industry now.

"My opinion is that this paper is not

my most important contribution to physics; it is certainly not a publication of outstanding scientific value. On the other side, it is hard work to finish such a compilation, especially since the data are of very different origin, applying very different measuring techniques: a) electric quadrupole hyperfine interaction of nuclei in atoms and molecules, e.g., atomic and molecular spectroscopy and Mössbauer effect; b) μ -mesonic X-ray measurements; c) electric giant-dipole resonance measurements; d) experimental B(E2)-values between rotational states and the ground state of nuclei (obtained from Coulomb excitation and half-life measurements); and e) reorientation effect in Coulomb excitation.

"The reason why this paper is cited so often is that the averaged values of all available experimental data on deformation parameters for each isotope are needed by many people working theoretically or experimentally in nuclear or atomic physics or even other fields.

"Since it is very troublesome and time consuming to look through the literature to find the best values of experimental data of the kind compiled in this paper, many people are happy to cite just this one compilation.

"Although I have many possibilities now to do experimental work at the University of Munich and I am actually involved in different kinds of research work in experimental nuclear physics, I am still interested in doing this compilation work.

"At the moment, Peter David, Institut für Strahlen- und Kernphysik, University of Bonn, Federal Republic of Germany, and I are preparing an updated version of this compilation of deformation parameters, including, in addition to quadrupole deformation, hexadecapole deformation."

1. Löbner K E G & Malmskog S G. Systematics of absolute gamma-ray transition probabilities in deformed odd-mass nuclei. *Nucl. Phys.* 80:505-44, 1966.
2. Löbner K E G. Systematics of absolute transition probabilities of K-forbidden gamma-ray transitions. *Phys. Lett. B* 26:369-70, 1968.