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Gamma-gamma angular correlations experiments using gaseous sources of Xe-125, Xe-127 and Xe-129

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GAMMA-GAMMA ANGULAR CORRELATION EXPERIMENTS USING GASEOUS SOURCES OF ^{125}XE, ^{127}XE AND ^{129m}XE

A dissertation submitted to the

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presented by

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5. CONCLUSION AND ACKNOWLEDGEMENTS

The present work shows that gaseous systems provide an interesting environment for performing various types of angular correlation experiments. Unperurbed angular correlationa can be measured either at low pressure, if the atomic state has spin J=0, or at high pressure, if the atom or ion is in a paramagnetic state. Apart from mixing ratios of nuclear transitions, magnetic moments of excited states can be measured in these systems. The possibility of varying easily and continuously the pressure of the gas allows to choose the time-dependence of the perturbation and to explore the full range of relaxation phenomena. Measurements at low pressure on paramagnetic ions have shown that the resonance due to crossing Zeeman levels does behave as expected theoretically.
Further research in this field could be done by studying the angular correlation as a function of both the pressure and an externally applied magnetic field. It could be possible in this way to identify the electronic states which would allow to determine e.g. quadrupole moments from the observed hyperfine splittings.

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