^{27}Al-NQR Study on Novel Phase Transition in $CeOs_2Al_{10}$

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We have performed ^{27}Al-NQR measurements in $CeOs_2Al_{10}$ which attracts much interest in the novel phase transition occurring at high temperature T_0=29 K. The phase transition is recently ascribed to a long range antiferromagnetic one by neutron scattering. However the reason why the T_0 is so high despite of the long Ce-Ce distance of 5.2 Åis not clear at present. The NQR parameters as for four Al sites within the five inequivalent Al sites were determined. These values provides the evidence of a similar local symmetry around Al sites to those in $CeRu_2Al_{10}$ and $CeFe_2Al_{10}$.
The novel phase is known to disappear under pressure more than about 2 GPa. We have performed NQR measurements under pressure. The distinct NQR splitting below T_0 under 0.6 GPa excludes a possibility of coexistence of regions with splitting and no splitting, indicating homogeneous phase transition. Thus the reduction of the entropy decrease associated with the transition ΔS with increasing pressure is not due to the change of the volume fraction of the novel phase. Even in relatively low pressure 0.6 GPa, the nuclear spin-lattice relaxation rate $1/T_1$ is suppressed over whole temperature range compared with that in ambient pressure. $1/T_1$ does not show any critical slowing down at T_0, rather promotes the behavior seen in ambient pressure that the gap opens at higher temperature than T_0.