Damping of giant resonances in non-Markovian approach *

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The relaxation mechanisms of collective motion and temperature dependence of the damping widths in many-body systems have been much investigated during recent years. In this contribution the damping widths of the giant dipole resonances in heated nuclei are calculated and discussed on the base of the semiclassical second RPA[1] as well as within the nuclear fluid-dynamics method[2,3].

The expression for collisional relaxation time, τ_c, is taken within framework of two approaches: ***i***) it is calculated using the non- Markovian collision integral of the Landau-Vlasov transport equation[4]; ***ii)*** the time τ_c is obtained on the base of decay rates of the interparticle interactions within framework of the exciton model[5]. The collision integral in approach ***i)*** is taken in a modified form with allowance for reaching the local equilibrium in system. In particular, in the approach ***ii)*** a dependence of the $\tau_c(\omega, T)$ on collective vibration frequency and the temperature agrees with that one from[6], when the mean square matrix element of interparticle collision from[7] is used.

The width of the giant dipole resonance is calculated as a function of excitation energy for the Sn and Pb nuclei region. The widths calculated within nuclear fluid-dynamics method[2,3] show much weaker variation with temperature in comparison with those ones according to the semiclassical $SRPA$.

1.G. F. Burgio and M. Di Toro, Nucl. Phys. **A476**, 189 (1988).
2.V.M.Kolomietz, V.A.Plujko, S.Shlomo, Phys.Rev.C54(1996)3014.
3.V.A.Plujko,Acta Phys.Pol,B30(1999)1383.
4. V. M. Kolomietz, V. A. Plujko, Phys. At. Nucl. **57**, 931 (1994).
5. E. Gadioli and P. E. Hodgson, *Pre-Equilibrium Nuclear Reactions* (Clarendon Press, Oxford, 1992).
6. A. Bonasera, G.F.Burgio, M.Di Toro, Phys. Let. B221(1989)233.
7. P. Oblozinsky, Phys. Phys. **C35**, 407 (1987).

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