








International Conference
"Functional Materials"

ICFM - 2009

ABSTRACTS

Ukraine, Crimea, Partenit
2009

DP-1P/44 **Kubo-Anderson oscillator and NMR of solid state**

Olszewski M.[1], Sergeev N.A.[1], Levchenko A.V.[2], Sapiga A.V.[2]

[1]*Institute of Physics, University of Szczecin, Poland*

[2]*Faculty of Physics, Taurida National University, Crimea, Ukraine*

The Kubo-Anderson oscillator is described by equation [1,2] $\dot{x} = i\omega(t) \cdot x$ (1), where $\omega(t)$ is a stochastic function of the time.

In NMR and EPR there are many dynamical problems, which may be described by Eq.(1). We consider only some of these problems:

1. The shape of NMR absorption line for the case when NMR resonance frequency $\omega(t)$ is the random function of the time [3].

2. The shape of NMR absorption line for the case when random fluctuations of NMR resonance frequency $\omega(t)$ can't be describe by Markov stochastic process [4,5].

3. The shape of spin echo signals in spin systems with stochastically fluctuated NMR resonance frequency $\omega(t)$ [6].

4. The shape of spin echo signals in spin systems for the case when random fluctuations of NMR resonance frequency $\omega(t)$ can't be describe by Markov stochastic process.

5. The temperature dependences of the second moment of NMR absorption line and spin-lattice relaxation rates for the case when potential barrier for internal mobility of resonant nuclei is stochastic function of the time [7].

6. The temperature transformations of one- and two-dimensional NMR line shape of water molecules in hydrated crystals [8,9].

1. R.Kubo, J.Phys.Soc.Japan, 9 (1954) 935
2. P.W.Anderson, J.Phys.Soc.Japan, 9 (1954) 316
3. M.Olszewski, N.A.Sergeev. Physics of Solid State 50 (2008) 1935
4. M.Olszewski, N.A.Sergeev, A.V.Sapiga. Zeitschrift für Naturforschung 59a (2004) 501
5. M.Olszewski, N.A.Sergeev. Zeitschrift für Naturforschung 63a (2008) 688
6. N.A.Sergeev, M.Olszewski. Solid State NMR 34 (2008) 167
7. N.A.Sergeev, M.Olszewski. Journal of Physics: Cond.Matter, 20 (2008) 175208
8. M.Olszewski, N.A.Sergeev, D.A.Levchenko, A.V.Sapiga, Abstracts of International Conference "Functional Materials", October 1-7, 2007, Crimea, Ukraine, p.527
9. M. Olszewski, N.A.Sergeev, D.A.Levchenko, A.V.Sapiga, Since Notes of the Taurida National University, 21(60) (2008) 125