# SLOW ENERGY RELAXATION IN QUASI-1 D CONDUCTORS AT LOW TEMPERATURE

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Slow energy relaxation on time scales $\approx 1$ to $10^5$ sec at low temperature ($T \leq 1K$), has been recently evidenced as being one characteristic property of the disordered ground state (charge or spin density wave) of quasi-1D conductors [1,2], among other thermodynamic or dielectric properties.

In the present contribution, we report about a study of the heat relaxation in the organic spin density wave (SDW) compound $(TMTSF)_2PF_6$, using a similar procedure as in the case of stuctural glasses, i.e. with a "charging" temperature $T_1$ much larger than the equilibrium-reference temperature $T_0$, and at variance to our previous procedure with a small increase dT/T of less than 10%.

We have analysed the heat release $\dot{Q}$ (t) over a time interval from $\approx 10$ s to $10^3$-$10^4$ s with a modified version of the standard Tunneling Model, which was previously applied with sucess to the case of stuctural glasses and amorphous alloys [3,4], by introducing a low-time cutoff in the distribution of the relaxation times of the tunneling states:

$$\dot{Q}/m = (\pi^2 k_B^2/24)\, V\, P\, (T_1^2 - T_0^2)\, t^{-1} [1-\exp-(t/\tau_{min})]$$

with V the sample volume, and P the density of states of T.S.

In addition to the presence of $\tau_{min}$ ($\approx$ several tens sec), which is a rough approximation for a much slowler decreasing distribution, the present system shows large differences to the stuctural glasses:

1. The density of states P is 3 – 4 orders of magnitude larger , which explains the large effects we have already measured in small dT conditions [1,2].
2. P is temperature dependent, increasing at lower $T_0$.
3. $\dot{Q}$ is very sensitive to the application of a small magnetic field (H< 0.5 T); this could be related to the magnetic nature (SDW) of the ground state.

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