Poster Presentation

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Phason dynamics of quasicrystals

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Phason dynamics constitutes a challenging and interesting subject in the study of quasicrystals, since there is not a unique model in the literature for the description of the dynamics of the phason fields. Here, we introduce the elastodynamic model of wave-telegraph type for the description of dynamics of quasicrystals [1, 2]. Phonons are represented by waves, and phasons by waves damped in time and propagating with finite velocity; that means the equations of motion for the phonons are partial differential equations of wave type, and for the phasons partial differential equations of telegraph type. The proposed model constitutes a unified theory in the sense that already established models in the literature can be recovered as asymptotic cases of it. Several noteworthy features characterize the proposed model. The influence of the damping in the dynamic behavior of the phasons is expressed by the tensor of phason friction coefficients, which gives the possibility to take into account that the phason waves can be damped anisotropically. In terms of the phason friction coefficient and the average mass density of the material an important quantity, the characteristic time of damping, can been defined. Another important advantage of the model is that it provides a theory valid in the whole regime of possible wavelengths for the phasons. In addition, with the telegraph type equation there is no longer the drawback of the infinite propagation velocity that exists with the equation of diffusion type.

[1] *E. Agiasofitou, M. Lazar, Int. J. Solids Struct., 2014, 51, 923-929.,* ***[2]*** *E. Agiasofitou, M. Lazar, Mech. Re. Commun., 2014, http://dx.doi.org/10.1016/j.mechrescom.2014.01.006.*

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