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"Thermal Spike" Model Applied to Thin Targets Irradiated with Heavy Ion Beams at Low Energy

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During some experiments at GANIL, it was observed that some targets were soon deteriorated at very low intensity of heavy ion beam while the estimated temperature at equilibrium was far below the melting point of the material. An explanation of this observation would be the induced tracks due to irradiation of targets with heavy ion beams which result from the quench of the liquid phase of the material along the ion path. The model "thermal spike" described in [1], [2], [3] [4] was then applied to the experimental systems, the simulations enable to calculate the internal energy of target atoms and so their transient temperature along the ion track. We propose to discuss about this model and its application to the experimental systems.

[1] C. Dufour, A. Audouard, F. Beneu, J. Dural, J. P. Girard, A. Hairie, M. Levalois, E. Paumier et M. Toulemonde, «A high-resistivity phase induced by swift heavy-ion irradiation of Bi: a probe for thermal spike damage ?,» J. Phys. Condens. Matter, vol. 5, p. 4573, 1993.

[2] C. Dufour, Z. G. Wang, E. Paumier et M. Toulemonde, «Transient thermal process induced by swift heavy ions: defect annealing and defect creation in Fe and Ni,» Bull. Matter. Sci., vol. 22, p. 671, 1999.

[3] M. Toulemonde, C. Dufour, A. Meftah et E. Paumier, «Transient thermal process in heavy ion irradiation of crystalline inorganic insulators,» Nucl. Instr. Meth., Vols. %1 sur %2166-167, p. 903, 2000.

[4] Z. G. Wang, C. Dufour, E. Paumier et M. Toulemonde, «The Se sensitivity of metals under swift-heavy-ion irradiation: a transient thermal process,» J. Phys. Condens. Matter, vol. 6, p. 6733, 1994.

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