

**PL-20****TRANSMISSION ELECTRON MICROSCOPY IN SITU:  
PHASE-TRANSITIONS, CRYSTAL GROWTH,  
e-BEAM ANNEALING OF AMORPHOUS FILMS****V. Yu. Kolosov**

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**Abstract.** In this paper starting from a short review we present our *in situ* TEM studies of thin-film transformations initiated by electron beam primarily for initially amorphous layers of several oxides and chalcogen-based materials.

To change electron beam illumination we change condenser apertures and condensers currents with different beam focusing and beam currents. For some in-situ studies thermal heating of the sample in the TEM holder was added. Annealing of some similar TEM samples outside TEM column was performed to control any specific influence of e-beam. Most experiments have been done for 100KV and 200 KV in different Philips/FEI, JEOL and Tesla TEMs but higher (300Kv) and lower (5 Kv, using LVEM-5) accelerating voltages were also used.

Special attention is paid to the growth of unusual transrotational crystals and corresponding reversible transformations amorphous – crystalline that are important for memory devices based on PCMs (phase-change materials).

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