Electronic Supplementary Material (ESI) for Nanoscale

Supplementary information: Crystal structure assessment of Ge-Sb-Te phase change nanowires

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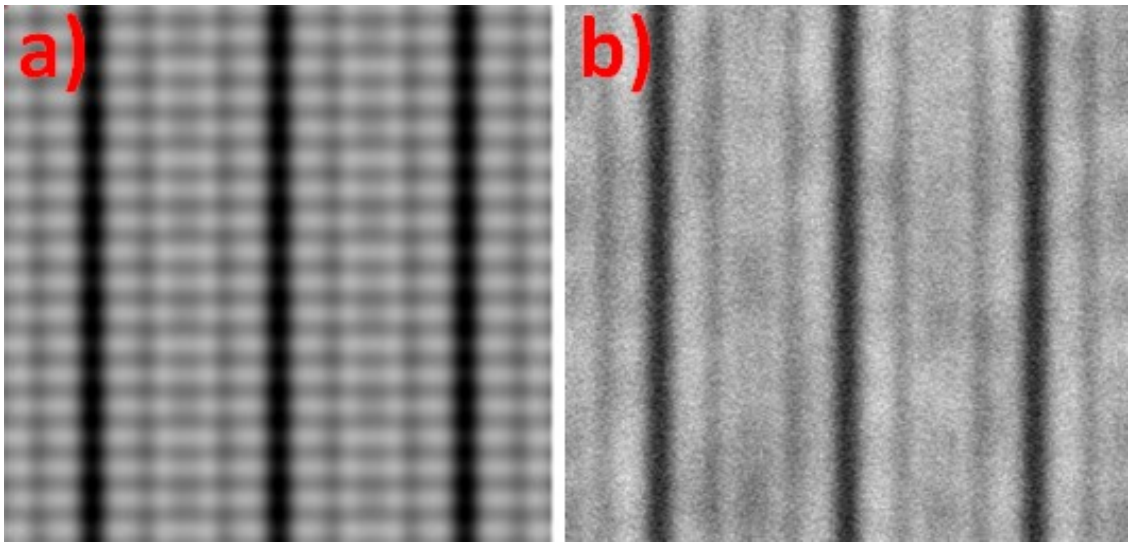

Figure S1: How the actual achievable resolution is reduced by the effect of the typical experimental signal/noise ratio and of even small misorientation: the lattice fringes visible in the row simulation a) disappear when the effects of the S/N ratio measured experimentally (S/N = 25) and a misorientation of about 15 mrad are taken in account b).

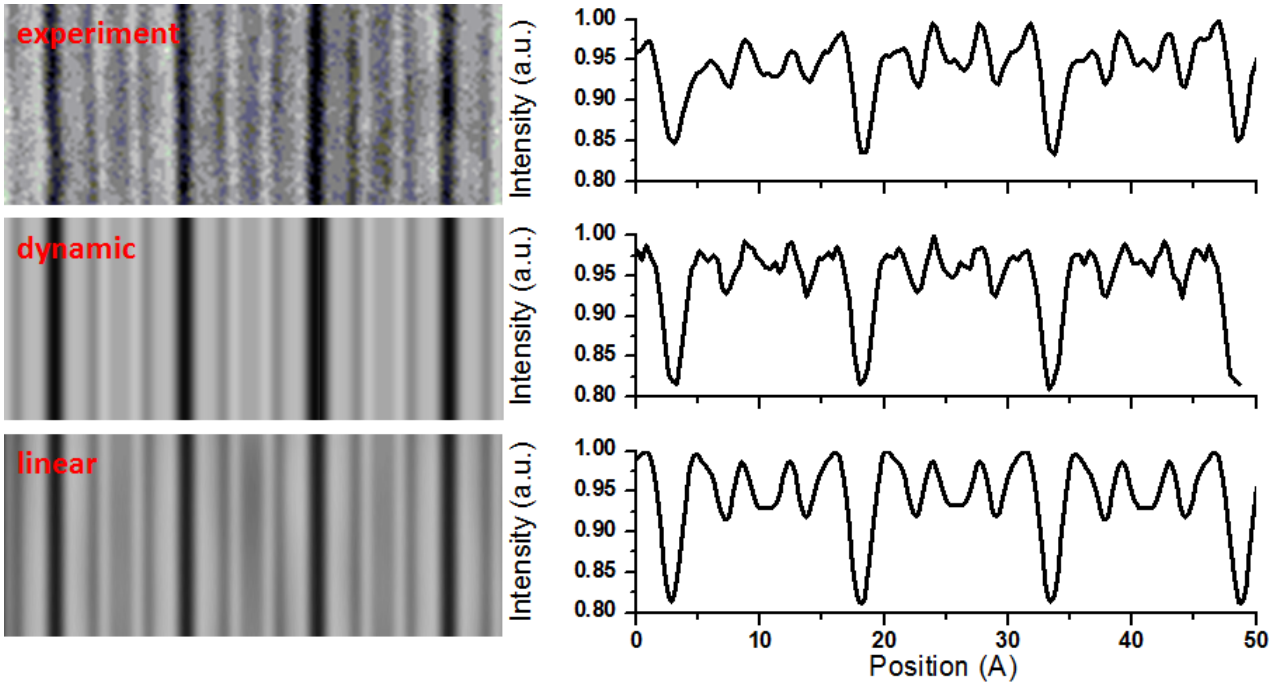

Figure S2: comparison between the linear and the full dynamical simulations. The experimental specimen thickness, given the cylindrical shape of the wires, was obtained by simple geometrical considerations from the measurement of their diameter. No significant differences are present by sight. The cross correlation between dynamic simulation and the experimental data is 91.6% against the 89.3% of the linear one. The cross correlation between the dynamic and the linear simulation is above 95% testifying the absence of strong dynamical effects.

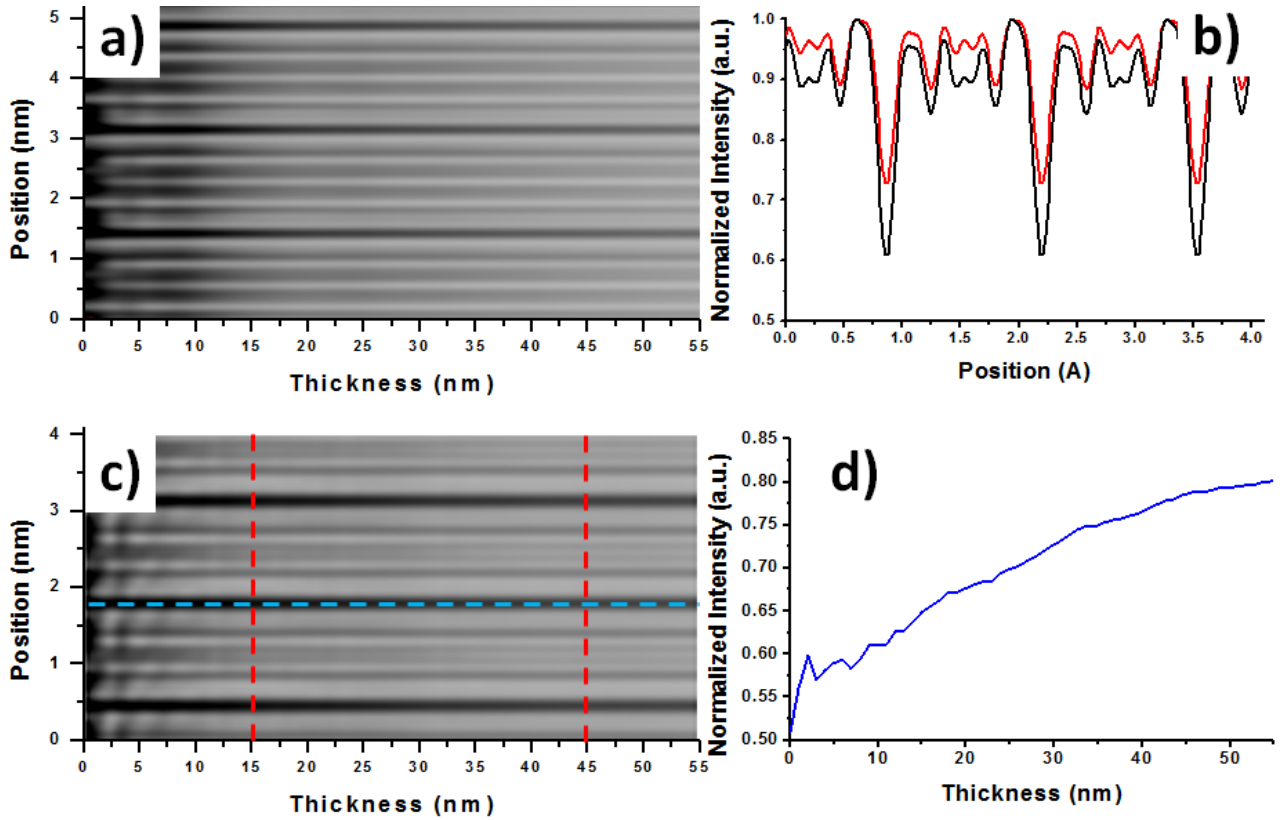

Figure S3: a) and c) represent the average image contrast at any thickness value of the identified structures of GST-225 and GST-124 phases respectively. They were obtained by dynamical simulations and are reported as a function of the sample thickness. The thickness ranges between 0 and 55 nm, that is the typical diameter range of the nanowires studied in this work.

It is apparent that the contrast pattern doesn't change for thickness higher than 10 nm, except for the addition of an offset. This offset, being a linear term, does not affect the cross-correlation indicator, as mentioned in the main text.

In panel b), the intensity line profile for thicknesses of 15 and 45 nm are shown, taken along the red dotted lines in c; the cross correlation coefficient between them is 0.988, in spite of the offset.

In panel d) of the above figure, we reported the simulated intensity inside the Van der Waals gap (dashed blue line in c). This graph demonstrates that it gives a direct measurement of the thickness.