Fig. 1. Dependence of the LO phonon Raman band FWHM on T_{GeOI} for uncoated (black squares) and Al_2O_3-coated (red squares) GeOI.
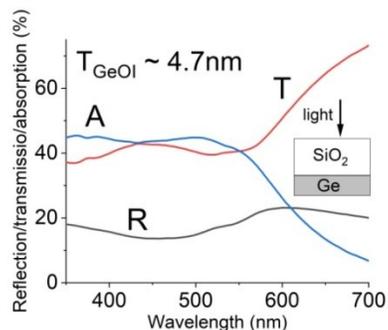

Fig. 2. Experimental reflection (black), transmission (red) and absorption (blue) spectra of ~ 4.7 nm thick GeOI at the light incidence from the substrate side.

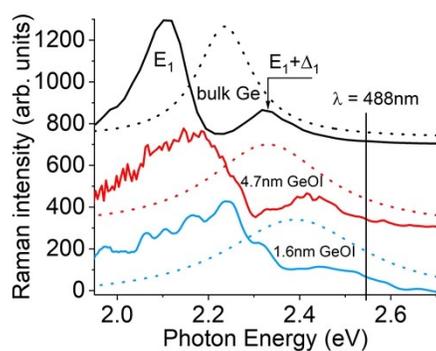

Fig. 3. Theoretical Raman intensities of bulk Ge (black solid line), 4.7nm (red solid line) and 1.6 nm (blue solid line) thick GeOI calculated via $|d\varepsilon/dE|^2$. Lorentz curve fitting of experimental bulk Ge Raman intensities (black dotted line). Estimated resonance Lorentz curves taking into account band blue shift and broadening for 4.7 nm (red dotted line) and 1.6 nm (blue dotted line) thick GeOI. The vertical black line corresponds to the 488 nm excitation wavelength.
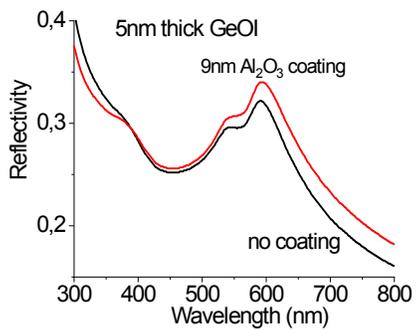
Fig. 4. Calculated reflection spectra of uncoated (black) and coated (red) 5 nm thick GeOI at the light incidence from the GeOI side. Bulk Ge optical constants were used.
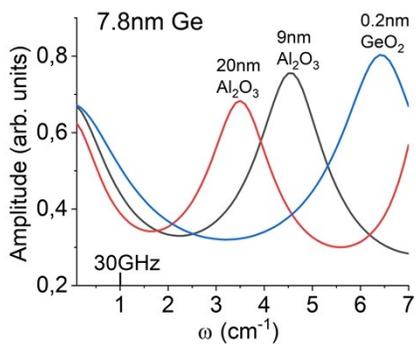

Fig. 5. Calculated spectra of the acoustic wave amplitudes in the 7.8 nm thick GeOI coated with 9 nm (black) and 20 nm (red) thick Al_2O_3. The amplitude of the naturally oxidized GeOI is shown with the blue line.