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Critical thickness of transition from 2D to 3D growth and peculiarities of quantum dots formation in $\text{Ge}_x\text{Si}_{1-x}/\text{Sn}/\text{Si}$ and $\text{Ge}_{1-y}\text{Sn}_y/\text{Si}$ systems

Kirill A. Lozovoy , Andrey P. Kokhanenko ,
Alexander V. Voitsekhovskii

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Highlights

- New approach for modeling growth processes of semiconductor compounds is presented.
- Decrease in 2D-3D transition temperatures for GeSiSn/Si compared to GeSi/Si is explained.
- Dependencies of critical thickness on temperature and composition are explained.
- Islands size decreases with increase in deposition rate and decrease of temperature.
- The simulated data are in a good agreement with experimentally observed results.

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