Ballistic hole emission spectroscopy of self-assembled GeSi/Si(001) nanoislands

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Ballistic hole emission microscopy spectroscopy has been applied to study the electronic structure of the hole states in the self-assembled GeSi/Si(001) nanoislands. The ballistic hole emission microscopic images demonstrated the spots of increased collector current related to the ballistic electron tunnelling via the confined valence band states in the GeSi/Si(001) nanoislands. In the ballistic hole emission spectra of the Ge hut clusters the stepwise features attributed to the quantum confined hole states have been observed. The results of present study demonstrate the capabilities of the ballistic hole emission microscopy spectroscopy in the characterization of the electronic structures of the valence band states in the GeSi/Si nanostructures.

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