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Surface states in quantum confined periodic systems PEDRO PEREYRA, MARIA FERNANDA AVILA, UAM-Azcapotzalco, Mexico — Using recently published analytical expresions for eigenvalues and eigenfunctions of 1-D finite periodic systems, we calculate surface energies and wave fuctions of 1-D quantum confined systems. We analyse the surface repulsion effect and calculate exactly the surface energy levels for different potential profiles and different potential discontinuities at the surfaces. We study also the localized surface states and their relevance in the optical response of laser devices, which active region is a semiconductor superlattice. We discuss the advantages of this approach compared with the approximate calculations based on the Bloch functions and the so-called band- edge states.

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