Zeroes of the spectral density of the Schrödinger operator with a periodic potential and Wigner-von Neumann perturbation

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We consider Schrödinger operator on the half-line with periodic background potential and Wigner-von Neumann potential $\frac{c\sin(2\omega x+\delta)}{x+1}$. It is known that the continuous spectrum of such operator has the same band-gap structure as the free periodic operator, whereas in each band of the absolutely continuous spectrum there exist two points (so-called critical or resonance) where the operator has a subordinate solution, which can be either an eigenvalue or a 'half-bound' state. The phenomenon of an embedded eigenvalue is unstable under the change of the boundary condition as well as under the local change of the potential. In the general case the spectral density of the operator has zeroes of the power type at critical points. This phenomenon is stable in the above-mentioned sense.