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| | **abstract** | | **abstract** | We use the Floquet-Bloch transform to reduce variational formulations of surface scattering problems for the Helmholtz equation from periodic and locally perturbed periodic surfaces to equivalent variational problems formulated on bounded domains. To this end, we establish various mapping properties of that transform between suitable weighted Sobolev spaces on periodic strip-like domains and coupled families of quasiperiodic Sobolev spaces. Our analysis shows in particular that the decay of solutions to surface scattering problems from locally perturbed periodic surfaces is precisely characterized by the smoothness of its Bloch transform in the quasiperiodicity. | | |
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