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## High-energy limit of quantum and classical wave scattering observables

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We study the space of quantum and classical observables for the radiation emitted by a scalar moving in gauge and gravitational plane-wave backgrounds. We explore the structure of new localised observables such as the momentum and angular momentum flow, as well as their global analogues. We observe that classical observables exhibit a power-law divergence in QED and a logarithmic divergence in general relativity (GR), even when radiation reaction is included, and show that these can only be resolved in the full quantum theory.

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