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Towards regularized higher-order computations in QFT without DREG (15' + 5')

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In this talk, we review the basis of the loop-tree duality theorem, which allows to rewrite loop level amplitudes in terms of tree-level like structures. Since the loop measure is converted into a phase-space one, both virtual and real contributions are expressible using the same integration variables. A physically motivated momentum mapping allows to generate the real emission process starting from the Born kinematics and the loop momenta. The integrand-level combination leads to regular functions, which can be integrated without using dimensional regularization (DREG) and correctly reproduce the finite higher-order corrections to physical observables. We explain the implementation of this novel approach to compute some physical processes, and we show how to deal with both IR and UV divergences without using DREG.

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