On the construction of amplitudes with Mandelstam analyticity from observable quantities

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It is shown that the problem of the construction of scattering amplitudes with Mandelstam analyticity from knowledge of their modulus in the three physical channels can be reduced, within a rather large class of functions, to the second Cousin problem of the theory of functions of two complex variables. As a consequence, it can be solved completely and explicitly. We derive conditions on the modulus function, under which at least one solution exists, as well as criteria for the correct resolution of the discrete ambiguity at fixed energy.

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