Constraints on phase-shift analysis from two-variable analyticity

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We discuss the ambiguity in the determination of phase shifts, allowed by knowledge of the modulus in the three physical channels, for an amplitude which satisfies Mandelstam analyticity and has normal thresholds. We show that, under certain (weak) conditions, the ambiguity is of a discrete type, rather than continuous, as one would expect from the situation in one complex variable. The study is independent of the requirement of elastic unitarity and rests mostly on the analyticity properties of the amplitude.