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CDD POLES, INELASTICITIES AND OPTIMIZATION OF N/D EQUATIONS

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Abstract: In solving a mathematical problem where the input consists of data endowed with some precise property – as that of being limiting boundary values of holomorphic (and unitary) amplitudes – one can proceed in many (usually infinitely many) equivalent ways. It is important to notice that this equivalence is broken when noise appears under some form, either because of the lack of precision of the data one is provided with, or because of mere lack of knowledge concerning them on some regions. One is then faced with the meaningful question of finding among all tautological ways of solving the problem, that one which leads to results closest to the ideal (precise) ones.

The present paper deals with the optimization in the above sense of the N/D equations (started in a previous work). Its first part is concerned with the determination of allowed regions for the residua of the CDD poles, from conditions of consistency with a specified allowed error-channel. Its second part treats the question of optimization in the presence of inelasticities – first globally, with the Chew-Mandelstam and Froissart parametrizations – and finally generalizes the procedure to binary coupled channels (matrix N/D equations).

Apart from the mathematical aspect, it is the aim of this paper to provide the reader with workable formulas ready for applications.