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2-Particle Asymptotic Completeness and Bound States in Weakly Coupled Quantum Field Theories

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Abstract. Rigorous results on poles of the 2- and 4-point functions, which yield 2-particle asymptotic completeness and give information on the presence or absence of 2-particle bound states and resonances, are presented for weakly coupled even and non-even-field theories with mass gap in space-time dimension $d=2,3$ (and for related hypothetical theories in dimension 4). Methods used are more convenient and more general than those used previously (with more limited results) for $P(\varphi)_2$ theories.

Contents

1. Introduction

Results on poles of the momentum-space 2- and 4-point functions, relevant in the study of 2-particle asymptotic completeness, bound states and resonances have been obtained in the second part of the seventies for weakly coupled even $P(\varphi)_2$ models [GJS, SZ, DE 1, 2] and in a more limited way [K 1, GJ] for non-even $P(\varphi)_2$

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