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Representing vertex function in inhomogeneous frequency grid and its application in parquet formalism KA-MING TAM, SHUXIANG YANG, JUANA MORENO, MARK JARRELL, Louisiana State University — Representing two-particle vertices has always been a central issue in computational many body methods such as the parquet formalism, a self-consistent two-particle field theory. Despite the great effort over the past two decades, its application is very limited. This is predominately due to two crucial factors–the stability of the iteration and the size of the memory allocation for representing the vertex. We previously demonstrated that the stability problem may be alleviated by explicitly restoring the crossing symmetry, making simulations beyond weak coupling for the Hubbard model feasible [1,2]. The next step for the practical applications of parquet formalism is to compress the memory required to represent the vertex. In this work, we elaborate a scheme which invokes an inhomogeneous frequency grid replacing the homogeneous Matsubara frequency grid, and thereby reducing the memory by over a order of magnitude. This may represent a crucial step towards the practical applications of the parquet formalism for large cluster sizes.

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Ka-Ming Tam
Louisiana State University

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