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Algorithms for disconnected diagrams.

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Computing disconnected diagrams on the lattice involves taking the trace of the inverse of the Dirac operator. This is a computationally challenging problem, however recent algorithmic improvements such as low mode averaging and hierarchical probing have increased the efficiency of this trace estimation. We detail an algorithm that builds upon hierarchical probing by deflating the near null space of the Dirac matrix. An additional order of magnitude of variance reduction is achieved by combining these two methods and we explore this synergy both theoretically and experimentally. Finally, we apply this algorithm to calculate contributions to the Pauli and Dirac form factors of the nucleon, and present initial results.

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