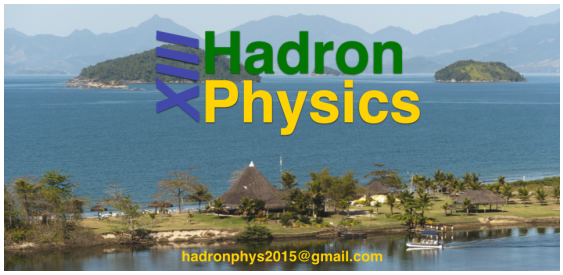

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Gluon Schwinger-Dyson equation in the PT-BFM scheme

One of the most widely used approach for studying the IR sector of QCD are the Schwinger-Dyson equations. This infinite system of coupled non-linear integral equations for all Green's functions of the theory is inherently
non-perturbative and can accommodate phenomena such as chiral symmetry breaking and dynamical mass generation. In practice, however, their usefulness hinges crucially on one's ability to devise a self-consistent truncation scheme that would select a tractable subset of these equations, without compromising the physics one hopes to describe. Here in this work, we will review, the PT-BFM truncation scheme, which is based on the synthesis of the pinch technique (PT) and the background field method (BFM). We will show that this truncation scheme implements a drastic modification already at
the level of the building blocks of the Schwinger-Dyson series, which after being rearranged, satisfy the Abelian Ward identities instead of the usual Slavnov-Taylor identity. As a result, gluonic and ghost contributions are separately transverse, within each order in the "dressed-loop" expansion. We will show explicitly, it is much easier to devise truncation schemes that manifestly preserve the transversality of the gluon self-energy.

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