On the Faddeev-Popov Operator Eigenspectrum in Topological Background Fields

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During the last years significant progress has been made in the understanding of the confinement of quarks and gluons. However, thi s progress has been made in two directions, which are at first sight very different. On the one hand, topological configurations seem to pla y an important role in the formation of the static quarkanti-quark potential. On the other hand, when studying Green's functions, the Faddee v-Popov operator seems to be of importance, especially its spectrum near zero. To investigate whether a connection between both aspects

exist, the eigenspectrum of the Faddeev-Popov operator in an instanton and a center-vortex background field are determined analyticall y in the continuum. It is found that both configurations give rise to additional zero-modes.This agrees with corresponding studies of vortice s in lattice gauge theory. In the vortex case also one necessary condition for the confinement of color is fulfilled. Some possible consequence s of the results will be discussed, and also a few remarks on monopoles will be given.

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