

## Quark confinement and gauge invariant monopoles in SU(2) YM

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Abstract: In this talk we begin on a new lattice formulation of the non-linear change of variables called the Cho–Faddeev–Niemi decomposition in SU(2) Yang-Mills theory. This is a compact lattice formulation improving the non-compact lattice formulation proposed in our previous work. Based on this formulation, we propose a new gauge-invariant definition of the magnetic monopole current which guarantees the magnetic charge quantization and reproduces the conventional magnetic-current density obtained in the Abelian projection based on the DeGrand–Toussaint method. Finally, we demonstrate the magnetic monopole dominance in the string tension in SU(2) Yang-Mills theory on a lattice. Our formulation enables one to reproduce in the gauge-invariant way remarkable results obtained so far only in the Maximally Abelian gauge.