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Title: Dirac cohomology and Lie algebra cohomology

Abstract: Lie algebra cohomology theory is a fundamental tool in study representations of reductive Lie groups. The  $(\mathfrak{g}, K)$ -cohomology and  $n$ -cohomology play important roles in classifications, geometric constructions, branching rules and automorphic forms. The Dirac cohomology defined by using Dirac operators introduced by Kostant, Paratharathy and Vogan is closely related to both cohomologies. We will talk about several joint works with Pandzic, with Pandzic and Renard and with Kang and Pandzic on Dirac cohomology. The aim of this talk is to show that Dirac cohomology can simplify the calculation and tackle many problems in a unifying theme.