

Meeting: 1003, Atlanta, Georgia, SS 11A, AMS Special Session on Riemannian Geometry, I

1003-53-1002 **Eduard Chiru*** (echiru@bellarmine.edu), Bellarmine University, Mathematics Department,
2001 Newburg Road, Louisville, KY 40205. *Harmonic forms on cohomogeneity one four
manifolds.*

By Hodge Theory, the space of harmonic forms of a closed Riemannian manifold is finite dimensional and is isomorphic as a vector space to the de Rham cohomology group. In general, the direct computation of harmonic forms is very hard except for some very symmetric spaces such as Lie groups. We explicitly compute the harmonic two forms on simply connected cohomogeneity one four-manifolds for a class of cohomogeneity one metrics. We show that the second Betti number is at most two. Moreover, in case of equality, we prove that the space of harmonic two forms is spanned by one self-dual and one anti-self dual form.

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