

Meeting: 1006, Lubbock, Texas, SS 15A, Special Session on Discrete Groups, Homogeneous Spaces, Rigidity

1006-53-33 **Victor Patrangenaru*** (vpatrang@math.ttu.edu), Department of Mathematics and Statistics,
Texas Tech University, Lubbock, TX 79409-1042. *Metric classification of 3D Riemannian
homogeneous spaces of positive Ricci curvature.*

We give an explicit formula of the metric tensor of a 3D homogeneous space of positive scalar curvature in terms of the principal Ricci curvatures at one point. The principal Ricci curvatures at a single point fully determine such an isometry class of a 3D Riemannian homogeneous space. Each isometry class can be represented by Lie group with a left invariant metric. Perelman's proof of the Poincaré conjecture in [Pe2002], [Pe2003] based on a Ricci flow approach is not yet fully confirmed yet. The problem raised in [Pa2004] that a 3D compact connected simply connected manifold has a Lie group structure is an open alternative in proving this conjecture.

References

[Pa2004] Patrangenaru, Vic, Correction to:"On the 3D Riemannian homogeneous spaces of positive sectional curvature"
Algebra Geom. Appl. Semin. Proc. 3-4 (2004), 19-21.

[Pe2002] Perelman, G., The entropy formula for the Ricci flow and its geometric applications. (2002) *http* :
//arxiv.org/abs/math.DG/0211159

[Pe2003] Perelman, G., Ricci flow with surgery on three-manifolds. (2003) *http* : *//arxiv.org/abs/math.DG/0303109*

(Received January 15, 2005)