

On the Classification of compact pseudo-riemannian G -symmetric spaces

Michel Goze * - Elisabeth Remm †

April 13, 2008

Let G be a finite abelian group. A G -symmetric space is an homogeneous manifold K/H such that the Lie algebra \mathfrak{k} of K admits a G -grading. The case corresponding to G cyclic is wellknown. For example, if $G = \mathbb{Z}_2$, we obtain the class of symmetric spaces. We are interested here in the case $G = \mathbb{Z}_2^k$. We give the classification when K is simple of classical type. We introduce the notion of riemannian G -symmetric spaces. These spaces are not necessary naturally reductive. We give the classification when $G = \mathbb{Z}_2^2$, K compact simple and we describe the corresponding pseudo-riemannian tensor metrics.

References

- [1] Bahturin, Yuri; Giamb Bruno, Antonio, *Group gradings on involution simple algebras*, Can. Math. Bull., to appear.
- [2] Bahturin, Y., Sehgal, S, and M. Zaicev, *Group Gradings on Associative Algebras*, J. Algebra **241** (2001), 677–698
- [3] Bahturin, Y., Goze, M., $\mathbb{Z}_2 \times \mathbb{Z}_2$ -symmetric spaces. Pacific Journal of Math. To appear (may 2008)
- [4] Berger, M., *Les espaces symétriques non compacts*, Ann.E.N.S. **74**, 2, (1957), 85-177.
- [5] Bouyakoub, Abdelkader; Goze, Michel; Remm, Elisabeth; *On riemannian $\mathbb{Z}_2 \times \mathbb{Z}_2$ -symmetric spaces and flag manifolds* arxiv math.DG/0609790. Preprint Mulhouse 2006.

*M.Goze@uha.fr.

†corresponding author: E.Remm@uha.fr, Université de Haute Alsace, F.S.T., 4, rue des Frères Lumière - 68093 Mulhouse - France.

- [6] Kac, Victor, *Graded algebras and symmetric spaces*, *Funct. Anal. Pril.* 2 (1968), 93 - 94.
- [7] Kowalski O., *Generalized symmetric spaces*, *Lecture Notes in Mathematics*, 805. Springer-Verlag, Berlin-New-York, 1980.
- [8] Lutz, Robert *Sur la géométrie des espaces Γ -symétriques* *C. R. Acad. Sci. Paris Sr. I Math.* **293** (1981), no. 1, 55–58.