Erratum to Extrinsic symmetric spaces and orbits of s -representations

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As has been pointed out by C. Olmos, the proof of Theorem 3 of our paper [EH1] is not correct. In fact it is not true in general that a totally geodesic submanifold N of a submanifold M with parallel second fundamental form in a euclidean space has parallel second fundamental form as well. However the theorem is true as can be seen by using the following arguments. An extrinsic symmetric space M is the orbit of the isotropy representation of some symmetric space G/K . If G/K is reducible then M splits together with its embedding. By the unique decomposition of compact Riemannian manifolds [EH2] we therefore may assume that G/K is irreducible, and by the proof of Theorem 1 we may further assume that K is the identity component of the group K' of all isometries of M which extend to the ambient space. Since K' contains the geodesic symmetries of M and M is compact, we have $K = I_0(M)$. Now, if $M = M_1 \times M_2$ is an intrinsic splitting with $\dim M_i > 0$ then it follows from [EH2] that K is the direct product of two nontrivial subgroups and that the isotropy group K_x for any $x \in M$ splits accordingly. It follows from the list of simply connected irreducible symmetric spaces (cf. [WZ], p. 324f) that K splits globally only if $(G, K) = (SO(p+q), SO(p) \times SO(q))$ where p or q (or both) are odd. However a simple computation shows that in this case no proper isotropy subgroup of the K -action splits accordingly (although there are extrinsic symmetric orbits which are *locally* products of spheres).

References

- [EH1] J.-H. Eschenburg, E. Heintze: *Extrinsic symmetric spaces and orbits of s -representations*, Manuscripta math. **88** (1995), 571 - 524
- [EH2] J.-H. Eschenburg, E. Heintze: *Unique decomposition of Riemannian manifolds*, Preprint Augsburg 1996
- [WZ] M. Wang, W. Ziller: *Symmetric spaces and strongly isotropy irreducible spaces*, Math. Ann. **296** (1993), 285 - 326

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