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## Para-Kähler-Einstein homogeneous manifolds of semisimple Lie group

A  $2n$ -dimensional pseudo-Riemannian manifold  $(M, g)$  is called para-Kähler if it admits a parallel para-complex structure  $K$  that is an involutive field of endomorphisms or, equivalently, two complementary  $n$ -dimensional isotropic parallel distributions  $L^\pm$ . Para-Kähler manifold can be also described as a symplectic manifold with symplectic form  $\omega = g \circ K$  and two complementary integrable Lagrangian distributions  $L^\pm$ . We give a description of homogeneous para-Kähler manifolds of real semisimple Lie group  $G$  in terms of its crossed Satake diagrams and invariant symplectic structures.

Using para-holomorphic geometry, we generalize some classical results of Kähler geometry to the para-Kähler case, in particular, derive a formula for the Ricci tensor in terms of para-holomorphic coordinates and para-Kähler potential. We give a classification of invariant para-Kähler-Einstein metrics on homogeneous manifolds  $M = G/H$  of semisimple Lie group in terms of Koszul forms.

The talk is based on joint works with C. Medori and A. Tomassini (Parma).