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Lattices in symplectic Lie Groups

A Lie group G equipped with a left invariant symplectic form ω^+ is called a symplectic Lie group and the pair $(\mathfrak{g}, \omega)$, where $\mathfrak{g}$ is its Lie algebra, the tangent space to G at the unit ε, is said a symplectic Lie algebra. Among others things, we determine connected and simply connected symplectic Lie groups of dimension four which have discrete cocompact subgroups, that is, uniform lattices. We describe in the solvable non nilpotent case, all isomorphy classes of lattices Γ and in this fashion obtain an infinity of nonhomeomorphic compact symplectic solvmanifolds. Finally we show that these four dimensional symplectic Lie groups have left invariant symplectic affine structures, that is, left invariant flat and torsion free symplectic connexions.

Keywords: Symplectic Lie groups, uniform lattices, left invariant affine structures.

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