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A class of compact Kählerian solvmanifolds and a general conjecture

It is now known that a non-toral nilmanifold has no Kähler structure. For solvmanifolds, we can see that a 4-dimensional compact solvmanifold has Kähler structure iff it is a hyperelliptic surface or a complex torus. Furthermore, they are all aspherical, that is, of the form G/Γ where G is a simply connected solvable Lie group and Γ is a uniform discrete subgroup of G. We state here a general conjecture on compact Kählerian solvmanifolds and show that it also holds for compact aspherical solvmanifolds:
Conjecture: A compact solvmanifold has a Kähler structure iff it is a finite quotient of a complex torus which is a holomorphic fiber bundle over a complex torus with fiber a complex torus.