Global solvability for smooth vector fields on S^3

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Abstract: In this talk we outline some global regularity and global solvability issues for classes of smooth (non)singular tangential vector fields on odd-dimensional sphere S^3. We provide results on the global solvability for classes of smooth vector fields associated in a natural way to intersection of linear $\mathbb{C}$ holomorphic flows and linear $\mathbb{R}^2$ actions on S^3. Moreover, for classes of vector fields which admit two cycles serving as attractors for all other orbits (i.e., the vector field is as in celebrated theorem of Wilson) we prove an abstract theorem which describes completely the possible singularities of the solutions and a dichotomy type assertion for the global hypoellipticity.
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