



SEMINÁRIO DE EQUAÇÕES DIFERENCIAIS

Global solvability and cohomology of tube structures on compact manifolds

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Resumo: In this talk, I discuss some new techniques to study the differential complexes associated with tube structures on $\mathbf{M} \times \mathbf{T}$ of corank m , in which \mathbf{M} is a compact manifold and \mathbf{T} is the m -torus. By systematically employing partial Fourier series, for complex tube structures, we completely characterize global solvability, in a given degree, in terms of a weak form of hypoellipticity, thus generalizing existing results and providing a broad answer to an open problem proposed by Hounie and Zugliani [Math Ann 369(3-4):1177–1209, 2017]. We also obtain new results on the finiteness of the cohomology spaces in intermediate degrees. In the case of real tube structures, we extend an isomorphism for the cohomology spaces originally obtained by Dattori da Silva and Meziani [Math Nachr 289(17-18):2147–2158, 2016] in the case in which \mathbf{M} is a n -torus. Moreover, we establish necessary and sufficient conditions for the differential operator to have closed range in the first degree.