Global analytic hypoellipticity of involutive systems on compact manifolds

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Given M a compact, connected and orientable, real-analytic manifold, and closed, real-valued, real-analytic 1-forms $\omega_1, \ldots, \omega_m$ on M, we characterize the global analytic hypoellipticity of the first operator featuring in the differential complex over $M \times \mathbb{T}^m$ naturally associated to a involutive system of vector fields determined by them. Global Gevrey hypoellipticity is determined simultaneously.