Symmetric tensors on the intersection of two quadrics and Lagrangian fibration

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Abstract

Let $X$ be an $n$-dimensional (smooth) intersection of two quadrics, and let $T^*X$ be its cotangent bundle. We show that the algebra of symmetric tensors on $X$ is a polynomial algebra in $n$ variables. The corresponding map $\Phi : T^*X \to \mathbb{C}^n$ is a Lagrangian fibration, which admits an explicit geometric description: its general fiber is a Zariski open subset of an abelian variety, the quotient of a hyperelliptic Jacobian by a 2-torsion subgroup. In dimension 3, $\Phi$ is the Hitchin fibration of the moduli space of rank 2 bundles with fixed determinant on a curve of genus 2.

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