Regular finite type conditions for smooth pseudoconvex real hypersurfaces in $\mathbb{C}^n$

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Abstract: Let $M$ be a smooth real hypersurface in $\mathbb{C}^n$ with $n \geq 2$. For any $p \in M$ and any integer $s \in [1, n - 1]$, Bloom in 1981 defined the following three kinds of integral invariants: invariant $a^{(s)}(M,p)$ defined in terms of contact order by complex submanifolds, invariant $t^{(s)}(M,p)$ defined by the iterated Lie bracket of vector fields and invariant $c^{(s)}(M,p)$ defined through the degeneracy of the trace of the Levi form. When $M$ is pseudoconvex, Bloom conjectured that these three invariants are equal. Bloom and Graham gave a complete solution of the conjecture for $s = n - 1$. Bloom showed that the conjecture is true for $a^{(1)}(M,p) = c^{(1)}(M,p)$ when $n = 3$. In this talk, I will present a recent joint work with Xiaojun Huang, in which we gave a solution of the conjecture for $s = n - 2$. In particular, this gave a complete solution of the Bloom conjecture for $n = 3$. 