On the spectrum of minimal submanifolds in space forms

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Abstract: Let $\varphi : M^m \to N^n$ be an immersed minimal submanifold in an ambient space close, in a suitable sense, to the space form $\mathbb{N}_k^n$ of sectional curvature $-k \leq 0$. In this talk, I survey on some recent results obtained in collaboration with various colleagues from Brazil, to ensure that the Laplace-Beltrami operator of M has purely discrete (respectively, purely essential) spectrum. In the last case, we also give an explicit description of the spectrum. Our criteria apply to many examples of minimal submanifolds constructed in the literature, and answer a question posed by S.T.Yau. The geometric conditions involve the Hausdorff dimension of the limit set of φ and the behaviour at infinity of the density function

$$\Theta(r) = \frac{\mathrm{vol}(M \cap B_r^n)}{\mathrm{vol}(\mathbb{B}_r^m)},$$

where $B_r^n, \mathbb{B}_r^m$ are geodesic balls of radius r in N^n and $\mathbb{N}_k^m$, respectively.
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