Critical Values of Calibrations and Minimal Submanifolds

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Abstract: A *calibration* on a Riemannian manifold (M, g) is a closed p-form φ with the property that, when restricted to a tangent p-plane, $\varphi \leq Vol_g$. A p-dimensional submanifold $N \subset M$ is calibrated if $\varphi_{|_N} = Vol_N$. Calibrated submanifolds are globally volume minimizing in their homology classes. Hence, they are a very good source of minimal submanifolds. These are the submanifolds corresponding to the global maximum value of a calibration, considering as a function on Grassmannian of p-planes. In this talk, starting with examples of calibrated submanifolds, I will show that submanifolds corresponding to any non-zero critical value of a calibration, namely *φ-critical submanifolds*, are also minimal under some conditions, and give some examples.