Foliations by Minimal Submanifolds and Ricci Curvature

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Let (M^n, g) be a closed, connected, oriented, C^∞, Riemannian, n-manifold with a transversely oriented, codimension-2 foliation **F**. Suppose the transverse volume form μ is basic and $\{X, Y\}$ are basic vector fields, so $\mu(X, Y) = 1$. Then the leaf component of $[X, Y]$, $\mathcal{V}[X, Y]$, is globally defined on M and is independent of the basic pair of vector fields $\{X, Y\}$ satisfying the above equation as observed by Cairns in. Using the Bochner technique, we show under appropriate assumptions on cohomology and on the Ricci curvature of the leaves of the foliation **F**, that the distribution orthogonal to that of the leaves, **H**, is integrable and the leaves of this new foliation are minimal surfaces of M. In the second section we provide some results for the special case when **F** is a Riemannian foliation.