# DUALITY AND MINIMALITY FOR RIEMANNIAN FOLIATIONS ON OPEN MANIFOLDS

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Let $\mathcal{F}$ be a Riemannian foliation of dimension $l$ and codimension $k$ on a smooth manifold $M$. If $M$ and $\mathcal{F}$ are orientable and $M$ is closed, the de Rham spectral sequence of $\mathcal{F}$ is finite dimensional and verifies the duality condition

$$E_2^{s,t} \cong E_2^{k-s,l-t}.$$

Moreover, the manifold admits a metric such that each leaf is minimal if and only if the basic cohomology in maximum degree, $E_2^{k,0}$, is non null [1].

When $M$ is an open manifold and the closures of the leaves define a regular compact foliation, a similar result holds,

$$E_2^{s,t} \cong E_{2,c}^{k-s,l-t},$$

where $E_{2,c}$ denote the spectral sequence with compact supports. The finiteness requires a natural additional condition. And the foliation is minimal if and only if $E_{2,c}^{k,0} \neq 0$.

A singular Riemannian foliation on a compact manifold induces, on the regular stratum, a foliation with the good properties. This case was considered in [2], where they prove, by a different method, the above minimality characterisation.

## References


[1] Masa, X. *Duality and minimality in riemannian foliations*, Comment. Math. Helv. **67** (1992), 17–27.

[2] Saralegi-Aranguren, M., Royo Prieto, J.I. and Wolak, R. *Tautness for riemannian foliations on non-compact manifolds*, Manuscripta Math. **126** (2008), 177-200