

We present our extension of Allard's celebrated rectifiability theorem to the setting of varifolds with locally bounded first variation with respect to an anisotropic integrand. In particular, we identify a necessary and sufficient condition on the integrand to obtain the rectifiability of every d -dimensional varifold with locally bounded first variation and positive d -dimensional density.

We can apply this result to the minimization of anisotropic energies among families of d -rectifiable closed subsets of \mathbb{R}^n . Applications of this compactness result are the solutions to three formulations of the Plateau problem: one introduced by Reifenberg, one proposed by Harrison and Pugh and another one studied by Guy David.

Moreover, we apply the rectifiability theorem to prove an anisotropic counterpart of Allard's compactness result for integral varifolds.

To conclude, we give some ideas of an ongoing project, which relies on the presented rectifiability theorem.