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*On a perturbation of the linearized two dimensional two-well problem*

The two dimensional two-well problem arises in the study of the zero energy states of a solid-solid phase transition in materials that exhibit the so-called shape memory effect.

This problem can be formulated as follows: find $u\colon \Omega \to \mathbb{R}^3$ such that

$$\nabla u \in K = \mathrm{SO}(2)U_a \cup \mathrm{SO}(2)U_b, \quad \text{a.e. in } \Omega, \tag{1}$$

where $U_a$ and $U_b$ are two traceless symmetric matrices, and $\mathrm{SO}(2)$ represents the set of proper rotations. The most simple nontrivial solution to (1) is given by the so-called simple laminates, that is, the function $u$ depends only on one cartesian coordinate. In fact, it was show by Dolzmann and Muller that if the perimeter of the transitions is finite, $u$ has to be simple laminate.

For a suitable energy and in the proper regime, we show that the nonzero energy states for the linearized version of (1), are also closed to a simple laminate.