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Variational problems in inelastic theory of biomembranes, smectic-A liquid crystals, and carbon related structures. (English) [Zbl 1112.74018](#)

Mladenov, Ivaïlo (ed.) et al., Proceedings of the 7th international conference on geometry, integrability and quantization, Sts. Constantine and Elena, Bulgaria, June 2–10, 2005. Sofia: Bulgarian Academy of Sciences (ISBN 954-8495-30-9/pbk). 237-248 (2006).

Summary: After a brief introduction to several variational problems in the study of shapes of thin structures, we deal with variational problems on two-dimensional surface in three-dimensional Euclidian space by using exterior differential forms and the moving frame method. The morphological problems of lipid bilayers and stabilities of cell membranes are also discussed. The key point is that the first- and second-order variations of free energy determine equilibrium shapes and mechanical stabilities of structures.

For the entire collection see [\[Zbl 1089.53004\]](#).

MSC:

74G65 Energy minimization in equilibrium problems in solid mechanics

74K15 Membranes

74L15 Biomechanical solid mechanics

82D30 Statistical mechanics of random media, disordered materials (including liquid crystals and spin glasses)

Keywords:

[moving frame method](#); [lipid bilayers](#); [free energy](#)

Full Text: [arXiv](#)