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Magdalena D Toda* (magda.toda@ttu.edu), Lubbock, TX 79409, and **Bhagya Athukorallage** (bhagya.athukoralla@ttu.edu), Lubbock, TX 79409. *Generalized Willmore surfaces and applications.*

Starting from a generalized Willmore energy functional which is justified from a physical viewpoint, we study certain generalized Willmore surfaces as minimizers of this type of energy. We use several geometric tools, which include a classical variational approach, as well as the Cartan frame method (Cartan forms). Several applications are provided, including some elastic surface models which present a special importance in microbiology, genetics and biophysics. (Received July 06, 2014)