1116-53-980　　　　**Thanuja Paragoda*** (`thanuja.paragoda@ttu.edu`), Texas Tech University, Department of Mathematics and Statistics, Broadway and Boston, Lubbock, TX 79409, and **Giorgio Bornia**, **Bhagya Athukorallage** and **Magdalena Toda**. *Willmore-type energies and Willmore-type surfaces in space forms.* Preliminary report.

The current report studies Willmore-type energies and Willmore-type immersions in space forms. First, we introduce the notion of deformed Willmore energy for a space form. Next, we discuss the corresponding Euler-Lagrange equation for the deformed energy. This approach provides a natural justification to Willmore's definition of the appropriate Willmore-type energy in a space form. We deduce the Euler-Lagrange equation of the deformed Willmore energy in a space form, in a unified way, using an extrinsic Laplace-Beltrami operator (which depends on both the surface metric, and the ambient space form). We consider both the case of closed surfaces and the one of surfaces with boundary, for which we gave and discussed the necessary boundary value conditions, which the previous literature failed to do. Thus, we show that our work provides a bridge between prior works in the field, as well as a novel approach. (Received September 15, 2015)

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