NUMERICAL FINITENESS RESULTS FOR MINIMAL SURFACES IN THREE-DIMENSIONAL SPACE FORMS

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Abstract. We present a new method, based on generalizations of Shiffman's variational principle, for the construction of minimal surfaces on Schwarzian chains in curved space forms. The main emphasis of our approach is on the computation of all minimal surfaces of genus zero (disks with holes) that span a given boundary configuration—even unstable ones. For many boundary configurations we derive numerical finiteness results on the number of minimal surfaces spanning a given boundary configuration. We use graphs of Shiffman's function to illustrate bifurcation phenomena and the Morse index of minimal surfaces. We also present some convergence results for the numerical method.