963-53-133 **Mohammad Ghomi** (`ghomi@math.sc.edu`), Department of Mathematics, University of South Carolina, Columbia, SC 29208, and **Ralph Howard*** (`howard@math.sc.edu`), Department of Mathematics, University of South Carolina, Columbia, SC 29208. *Unfoldings of Space Curves.*

Let $\mathcal{U}(L)$ be the set of Lipschitz maps $c\colon \mathbf{R} \to \mathbf{R}^n$ so that $\|c'(t)\| = 1$ almost everywhere and with $c(t+L) = c(t)$. This is the collection of unit speed parameterizations of closed rectifiable curves in $\mathbf{R}^n$ of length L. For any $c \in \mathcal{U}(L)$, let UnFold(L) be the set of curves $\overline{c} \in \mathcal{U}(L)$ so that $\|\overline{c}(s) = \overline{c}(t)\| \geq \|c(t) - c(s)\|$ for all s, t. Elements of Unfold(c) are *unfoldings* of c. We investigate compactness, regularity, and continuity of functionals on Unfold(c). Some sample results are (1) If $0 < \alpha \leq 1$ and c is $C^{1,\alpha}$, then any unfolding of c is also $C^{1,\alpha}$, (2) Functionals of the form $\mathcal{F}[\gamma] = \int_0^L \int_0^L f(s,t,\gamma(s),\gamma(t),\gamma'(s),\gamma'(t))\,ds\,dt$ are continuous on Unfold(c), provided f is continuous, (3) Every $c \in \mathcal{U}(L)$ has a planar convex unfolding. The last result can be used to show that circles are minimizers for a large class of Möbius invariant knot energies. (Received January 20, 2001)