Formation of wrinkles on a coated substrate

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We present a numerical model for a large-strain hyperelastic object with part of the boundary coated by a Cosserat shell. When the stress-free configurations of the two objects do not match, wrinkles form, which is interesting for various applications. The numerical model combines geometric finite elements with standard finite elements, and we prove that its solutions exist. The resulting algebraic minimization problem is solved by Riemannian optimization, and we obtain a good match with experimental results.

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