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Asymptotic Expansion of the Axisymmetric Linear-Elastic Shell Equations with Application to Determining the Elastic Moduli of Ultra-Thin Shells MARTIN NEMER, CARLTON BROOKS, Sandia National Laboratories — An asymptotic expansion of the axisymmetric linear-elastic shell equations is presented in the limit that h/r $\rightarrow$ 0 where h is the shell thickness and r is the characteristic radius of curvature. This solution is obtained using a WKB expansion, which doesn't rely on the shell being close to spherical, allows for turning points in curvature, and can be extended to include higher-order terms. The obtained solution is used to analyze experimental results for obtaining elastic moduli of ultra-thin shells of metal oxides on molten-metal drops.

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