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Existence and Blow-Up Behavior for Solutions of the Generalized Jang Equation

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The generalized Jang equation was introduced in an attempt to prove the Penrose inequality in the setting of general initial data for the Einstein equations. In this paper we give an extensive study of this equation, proving existence, regularity, and blow-up results. In particular, precise asymptotics for the blow-up behavior are given, and it is shown that blow-up solutions are not unique.

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