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Applicability of the Newman-Janis Algorithm to Modified Gravity Theories DEVIN HANSEN, Montana State Univ — The Newman-Janis algorithm is an appealing method to generate rotating black hole metrics from non-rotating ones. In this talk, I investigate the applicability of this algorithm in modified gravity theories, concentrating on quadratic gravity. We find that this algorithm leads to a metric that does not agree with slowly-rotating solutions in this theory, and in fact, does not even satisfy the modified vacuum field equations. I will also show that associating the latter with a stress-energy tensor implies the existence of naked singularities in the spacetime. This suggests that the Newman-Janis algorithm is not well-suited to generate rotating black hole solutions in modified gravity theories.

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