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http://atlas.mat.ub.es/sga

On the genus of curves in a Jacobian variety

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We will deal with the possible genus of a curve in a generic Jacobian variety. Given a birational morphism $\varphi : D \longrightarrow J$, where D is a complex smooth projective curve and J is a generic Jacobian of dimension $g \geq 4$, we will show that the genus of D satisfies either $g(D) = g$, or $g(D) \geq 2g - 2$. This gives a positive answer to a conjecture of J.C. Naranjo and G.P. Pirola who proved an analogous result for Prym varieties. We will then discuss whether the above result can be improved. There are some obstructions to the existence of curves of genus $2g-2$ on J and this is related to a property of Prym varieties of ramified coverings.
