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Division polynomials and canonical local heights on hyperelliptic Jacobians.  (English)  

The notion of a division polynomial is well-known for elliptic curves. Recently, several authors have given generalizations to the case of hyperelliptic curves and hyperelliptic Jacobians. The former case has been studied algebraically in [D. G. Cantor, J. Reine Angew. Math. 447, 91–145 (1994; Zbl 0788.14026)] and through the hyperelliptic sigma function in a series of paper by Ônishi. The latter case is worked out in [N. Kanayama, Math. Proc. Camb. Philos. Soc. 139, No. 3, 399-409 (2005); corrections ibid. 149, No. 1, 189–192 (2010; Zbl 1093.14042)] for genus 2. In this article, the author generalizes this last approach to any genus. He gives a determinantal expression of the division polynomial in terms of the hyperelliptic \( \wp \)-functions and also recurrence formulae. He then describes a condition that a point on the Jacobian is a torsion point and study relations with local height functions.

Reviewer: Christophe Ritzenthaler (Marseille)

MSC:
14H40 Jacobians, Prym varieties
11G10 Abelian varieties of dimension > 1
11G50 Heights

Keywords:
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Maxima; Macaulay2; Risa/Asir

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References: