

1039-11-46

Daniel Allcock (allcock@math.utexas.edu), Department of Mathematics, 1 University Station C1200, Austin, TX 78712, and **Jeffrey D. Vaaler*** (vaaler@math.utexas.edu), Department of Mathematics, 1 University Station C1200, Austin, TX 78712. *A Banach space determined by the Weil height.*

Let $\overline{\mathbb{Q}}^\times$ denote the multiplicative group of nonzero algebraic numbers. Write $\text{Tor}\{\overline{\mathbb{Q}}^\times\}$ for its torsion subgroup, and $\mathcal{G} = \overline{\mathbb{Q}}^\times / \text{Tor}\{\overline{\mathbb{Q}}^\times\}$ for the quotient group. The absolute logarithmic Weil height is well defined on \mathcal{G} and induces a metric topology in this group. We show that the completion of this metric space is a Banach space over the field \mathbb{R} of real numbers. We further show that this Banach space is isometrically isomorphic to a co-dimension one subspace of $L^1(Y, \mathcal{B}, \lambda)$, where Y is a certain totally disconnected, locally compact space, \mathcal{B} is the σ -algebra of Borel subsets of Y , and λ is a certain measure satisfying an invariance property with respect to the absolute Galois group $\text{Aut}(\overline{\mathbb{Q}}/\mathbb{Q})$. Some applications and related open problems will also be discussed. (Received February 28, 2008)