Parallelogram height inequalities over function fields

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Given an abelian variety A over a number field, and two finite subgroups G, H of A, the Faltings heights of the quotients of A by G, H, $G \cap H$, and $G + H$ satisfy an elegant relation called the "parallelogram inequality". This is a theorem of G. Rémond, which has interesting Diophantine consequences. More broadly, it complements a classical theorem of Faltings which relates the heights of A and A/G and contributes to our understanding of how heights vary under isogenies. In recent joint work with S. Le Fourn and F. Pazuki, we prove a perfect analogue of Rémond?s inequality in the context of abelian varieties over a function field, where the role of the Faltings height is played by the differential height. This result is part of our broader study of the variation of the differential height via isogeny in this setting. In a slightly different direction, in joint work with L. Baker and F. Pazuki, we prove an analogous parallelogram inequality for isogenous Drinfeld modules over a function field of positive characteristic. In this talk, I will discuss these questions concerning the interaction between isogenies and heights, state some of our results and, time permitting, sketch the key arguments in their proofs.