

# Inflection of linear series on hyperelliptic curves over arbitrary fields

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According to Plucker's formula, the total inflection of a linear series  $(L, V)$  on a complex algebraic curve  $C$  is fixed by numerical data, namely the degree of  $L$  and the dimension of  $V$ . The problem of describing the  $k$ -rational inflectionary locus of a  $Gal(\bar{k}/k)$ -linear series  $(L, V)$  when  $k$  is a non-algebraically closed field is significantly more subtle.

For example, the topology of the real inflectionary locus of a real linear series depends in a nontrivial way on the topology of the real locus of  $C$ . I will describe joint work with Biswas and Garay López in which we study this dependency when  $C$  is hyperelliptic and  $(L, V)$  is a complete series. Our main tool is a nonarchimedean degeneration, which allows us to relate the (real) inflection of complete series to the (real) inflection of incomplete series on elliptic curves.

I will also describe work in progress with Darago and Han in which we compute  $k$ -rational inflectionary loci valued in the Grothendieck-Witt group  $GW(k)$  of an arbitrary field  $k$ . To do so, we apply the  $A^1$  homotopy theory of Morel, Voevodsky, Levine, Kass and Wickelgren.

This is a joint work with I. Biswas, I. Darago, C. Han and C. Garay López.