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Integral-definite rational functions in theories of valued fields

An analogue for valued fields of Hilbert's Seventeenth Problem asks for an algebraic characterisation of rational functions which map a definable subset of the field into the valuation ring. In this talk, I will describe a model-theoretic solution to this problem which is uniform across different theories of valued fields. I will apply it to algebraically closed valued fields, real closed valued fields, and model complete theories of difference and differential fields with a valuation.