

Bend relations, valuations, and universal tropicalization

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Abstract:

Let X be a locally integral scheme over a non-archimedean valued field k . An embedding of X into a scheme equipped with a model over the field with one element determines a tropicalization of X , and the equations defining this tropicalization are given by 'bend relations'. The base-change adjunction between F_1 and k yields a universal embedding into an ambient space with F_1 model, and thus there is a universal tropicalization. Moreover, in this case solutions to the bend relations are exactly non-archimedean valuations on the structure sheaf of X . Thus the Berkovich analytification can be realized as an algebraic moduli space of valuations.