Affine Bruhat order and Kazhdan-Lusztig polynomials for p-adic Kac-Moody groups

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Abstract: The Iwahori-Hecke algebra is a crucial tool in the study of a reductive group over local fields, it admits a basis indexed by the associated affine Weyl group. In the general Kac-Moody setting, an equivalent was constructed by N. Bardy-Panse, S. Gaussent and G. Rousseau in 2016, defined by generators and relations over a basis indexed by a semi-group W^+ which plays the role of the affine Weyl group. Unlike in the reductive case, W^+ is no longer a (extended) Coxeter group, which makes classical Kazhdan-Lusztig theory inapplicable in this context. However in 2018 D. Muthiah and D.Orr have managed to define an order and a length function on W^+ analogous to the Bruhat order and the Bruhat length. Moreover, Muthiah gave a strategy to define Kazhdan-Lusztig polynomials for these algebras, using measures. We present several properties recently obtaine on this W^+-order, and their implications. This is a joint work with A. Hébert.