Periodic patterns in the representation theory of affine Kac-Moody algebras

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Abstract: We will show how moment graph techniques can be used to exhibit previously unknown periodic patterns in the structure of the category O over an affine Kac-Moody algebras. These patterns are closely related to the Feigin-Frenkel-Lusztig conjecture on the simple highest weight characters at the critical hyperplane, and also occur in the representation theory of reductive algebraic groups in positive characteristics.