Limit periods on curves and arithmetic heights

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We show that in a nodal degeneration of smooth curves, the periods of the resulting limit mixed Hodge structure (LMHS) contain arithmetic information. For instance, if the nodal fiber is identified with a smooth curve C glued at two points p and q then the LMHS relates to the Neron–Tate height of $p - q$ in the Jacobian of C. This observation combines an idea resembling "arithmetic deformation to the normal con" with a study of the divergence behavior of the periods of a degenerating family of curves. Joint work with Robin de Jong and Spencer Bloch.