Quantifier Elimination for generalised quasianalytic classes

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The expansion of the real field by all real analytic functions restricted to a compact set is model-complete (Gabrielov) and admits quantifier elimination in the expansion of its natural language by the function x $\mapsto$ 1/x (Denef - van den Dries). The aim of this talk is to extend these two central results in real analytic geometry to a large class of polynomially bounded o-minimal expansions of the real field. A generalised quasianalytic class is a collection of algebras of continuous real functions such that there is an INJECTIVE R-algebra homomorphism which associates a (divergent) power series with natural or real nonnegative exponents to the germ at 0 of each function in the collection. There are many examples of functions arising naturally in the context of dynamical systems, number theory and analysis, which belong to some generalised quasianalytic class: the solutions of Euler's differential equation on the node side, the Poincaré return maps of certain polycycles of analytic vector fields and functions related to the asymptotic behaviour of the Riemann Zeta function and Euler's Gamma function. I will show that a generalised quasianalytic class gives rise to a polynomially bounded o-minimal expansion of the real field and prove a quantifier elimination result for these structures (joint work with J.-P. Rolin).