Sets and B-series

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Simulation of ordinary differential equations with initial condition in a set of real numbers or with uncertain parameters is a difficult task. The most common approach to tackle this problem is Monte-Carlo associated to numerical simulation. Two main drawbacks of this technique are obvious: an important behavior can be missed and the combinatorial effect. In this talk, I will show that B-series can be extended to sets and computed by the help of different kind of set abstraction: boxes, zonotopes and polytopes.