

## Towards a description of the algebraic closure of multivariate power series

*lundi 12 septembre 2022 13:30 (40 minutes)*

We consider the algebraic closure of  $K((x))$ ,  $x = (x_1, \dots, x_r)$ ,  $\text{char}(K) = 0$ , namely what we call the field of algebroid Puiseux series, viewed as a subfield of the so-called field of rational polyhedral Puiseux series. Our target is to solve the following problems:

- given a polynomial equation  $P(x, y) = 0$  for  $P \in K[[x]][y]$ , provide a closed form formula for the coefficients of an algebroid Puiseux series solution  $y(x)$  in terms of the coefficients of  $P$ ;
- given an algebroid Puiseux series  $y(x)$ , reconstruct algorithmically the coefficients of a vanishing polynomial  $P \in K[[x]][y]$  using the coefficients of the series.

Our strategy involves the answers that we recently obtained to the same type of questions about algebraic Puiseux series, i.e. for the algebraic closure of  $K(x)$ .

Joint work in progress with M. Hickel (U. Bordeaux)

**Orateur:** Dr MATUSINSKY, Mickaël (Institut de Mathématiques de Bordeaux)