

SINGULARITÉS MARSEILLE-NICE-CHAMBÉRY

17-18-19 FÉVRIER 2012 - FRUMAM

1. PROGRAMME

Vendredi 14h : Helge Møller Pedersen : "Title: Classification of metrically conical rational singularities"

15h15: Nguyen Tat Thang : "Bifurcation set, asymptotic critical values and Newton polyhedrons"

17h : Saurabh Trivedi : "Transversality theorems for the weak topology"

Samedi 10h : David Trotman : "On the multiplicities of families of complex hypersurface-germs with constant Milnor number"

11h15 : Adam Grzesinski : "Horizontal critical locus and closed Reeb trajectories"

14h : Nivaldo Grulha Jr. : "Euler obstruction of a function"

15h15 : Thuy Nguyen Thi Bich : "Study of a singular set associated to a polynomial map"

17h : Olivier Le Gal :

Dimanche 9h30 : Krzysztof Kurdyka : "Reaching generalized critical points of a polynomial"

10h45 : Adam Parusiński :

12h : Michel Raibaut : "Motivic Milnor fibers of a rational fonction"

2. RÉSUMÉS

Adam Grzesinski :

Titre : Horizontal critical locus and closed Reeb trajectories

Résumé : A set of horizontal critical points of a smooth function on a contact manifold can be defined as a set of points where differential of this function and a contact form defining given contact structure are linear dependent. Generically this set is empty or is a smooth submanifold of dimension one. In a compact case we will show when components of it are closed orbits of some Reeb vector field associated with some contact form defining the same contact structure.

Krzysztof Kurdyka :

Titre : Reaching generalized critical points of a polynomial

Résumé : Let $f : \mathbb{K}^n \rightarrow \mathbb{K}$ be a polynomial of degree d ($\mathbb{K} = \mathbb{R}$ or $\mathbb{K} = \mathbb{C}$). We give an algorithm to compute the set of generalized critical values of f . The algorithm uses a finite dimensional space of rational arcs along which we can reach all asymptotic critical values.

Helge Møller Pedersen :

Titre: Classification of metrically conical rational singularities

Résumé : Let $X \subset (\mathbb{C}^N, 0)$ be a germ of complex singularity. The hermitian metric of \mathbb{C}^N induces a metric on X called the inner metric. The bilipschitz type of the inner metric is independent of the choice of embedding. It is well known that the topology of $(X, 0)$ is a cone over the link. A natural question is then when is the inner metric bilipschitz equivalent to a metric cone? We will give a complete answer to this question when $(X, 0)$ is a rational surface singularity, using the thick-thin decomposition of Birbrair, Neumann and Pichon.

Nguyen Tat Thang :

Titre : Bifurcation set, asymptotic critical values and Newton polyhedrons

Résumé: Every polynomial map $F : \mathbb{C}^n \rightarrow \mathbb{C}^m$ defines a locally trivial fibration outside an algebraic subset B of \mathbb{C}^m , the set B is called the bifurcation set of F . In this talk we give the relation between the set of asymptotic critical values and set of values determined explicitly in terms of the Newton polyhedrons of coordinate polynomials of F .

Thuy Nguyen Thi Bich :

Titre : Study of a singular set associated to a polynomial map

Résumé : In their paper (preprint) "Geometry of polynomial mappings at infinity via intersection homology", Anna and Guillaume Valette constructed a pseudomanifold N_F associated to a polynomial map $F : \mathbb{C}^2 \rightarrow \mathbb{C}^2$ with nowhere vanishing Jacobian. They showed that if the intersection homology of the set N_F is not trivial, then the polynomial map F is not isomorphic. This talk provides a method to stratify the set N_F and compute its intersection

homology.

Michel Raibaut :

Titre : Motivic Milnor fibers of a rational fonction

Résumé : Let P and Q be two complex polynomials and f the induced rational function which is well defined out of the common zeros of P and Q . During the nineties Gusein-Zade, Luengo and Melle introduced Milnor fibers of the germs of f at an indeterminacy point, and gave an A'Campo's formula for its monodromy zeta function. They also studied the global Milnor fiber and in each case proved existence of a bifurcation set. In this talk using Denef-Loeser (and more recently Guibert-Loeser-Merle) motivic integration approach we will construct corresponding motivic Milnor fibers which are motives containing additive and multiplicative invariants of these Milnor fibers. As an example we will obtain the A'Campo's formula for the monodromy zeta function.

Saurabh Trivedi :

Titre : Transversality theorems for the weak topology

Résumé : Openness of the set of maps transverse to a stratification implies that the stratification is a-regular (Trotman 1979). We prove a similar result for the weak topology in the real case and then we show how to use this result to prove a result analogous to Trotman's theorem for complex manifolds and holomorphic maps.

David Trotman :

Titre : On the multiplicities of families of complex hypersurface-germs with constant Milnor number. (joint work with Camille Plénat)

Résumé : We show that the possible drop in multiplicity in a polynomial family $F(z, t)$ of complex analytic hypersurface singularities with constant Milnor number is controlled by the powers of t . We prove equimultiplicity of μ -constant families of the form $f + tg + t^2h$ if the singular set of the tangent cone of $\{f = 0\}$ is not contained in the tangent cone of $\{h = 0\}$.

3. PARTICIPANTS

- Jean-Paul Brasselet (Marseille - IML)
- Nicolas Dutertre (Marseille - LATP)
- Nivaldo Grulha Jr. (Marseille - IML)
- Adam Grzesinski (Chambéry)
- Krzysztof Kurdyka (Chambéry)
- Julie Lapébie (Marseille - LATP)
- Olivier Le Gal (Chambéry)
- Philippe Maisonobe (Nice)

- Michel Merle (Nice)
- Helge Møller Pedersen (Marseille - IML)
- Claudio Murolo (Marseille - LATP)
- Thuy Nguyen Thi Bich (Marseille - IML)
- Nguyen Tat Thang (Nice)
- Adam Parusiński (Nice)
- Anne Pichon (Marseille - IML)
- Camille Plénat (Marseille - LATP)
- Michel Raibaut (Jussieu)
- Guillaume Rond (Marseille - IML)
- Saurabh Trivedi (Marseille - LATP)
- David Trotman (Marseille - LATP)