

1026-12-186

**Oleg Golubitsky\*** ([oleg.golubitsky@gmail.com](mailto:oleg.golubitsky@gmail.com)), Ontario Research Centre for Computer Algebra, Department of Computer Science, University of Western Ontario, London, Ontario N6A5B7, Canada. *Canonical representation of radical differential ideals.*

For every radical differential ideal, one can compute a decomposition into prime (or characterizable) components, which allows to test ideal membership. This representation of the radical differential ideal is not unique in three respects:

- The components are not unique.
- The representation of each component by a characteristic set is not unique.
- The decomposition and representation of each component depend on the choice of ranking on derivatives.

We will discuss how to make the representation unique, namely:

- A prime decomposition uniquely determined by the radical differential ideal can be computed by extending the algorithm for testing inclusion of quasi-algebraic sets proposed by W. Sit.
- The canonical characteristic set of a prime differential ideal can be obtained by imposing restrictions proposed by F. Boulier et al. We list some of its properties.
- In particular, the canonical characteristic set defines a differential analogue of the Gröbner cone. This will lead us to an algorithm that computes a ranking-independent universal characteristic decomposition of a radical differential ideal.

(Received February 26, 2007)