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Eugeny V. Pankratiev* (epankrat@gmail.com), Dept. of Mechanics and Mathematics,
Moscow State University, Leninskie Gory, 1, Moscow, 119992, Russia. *Standard bases in
differential algebra.*

Constructive methods in rings of differential polynomials are connected, first of all, with characteristic sets of differential ideals whose theory was developed by Ritt and Kolchin for prime differential ideals. Later it had been extended to a larger class of perfect differential ideals.

In the case of linear partial differential polynomials, this theory may be treated as the theory of Gröbner bases of differential modules, to which all methods and approaches of commutative Gröbner bases are applicable, in particular, the theory of staggered bases by Gebauer and Möller. Specifying some parameters in their algorithm, we obtain Janet's bases, a particular case of involutive bases.

Ollivier and Carra-Ferro proposed a definition of standard bases of differential ideals based on admissible orderings of differential monomials. Unfortunately, this basis is infinite for most of differential ideals (e.g., the ideal $[y^2]$). Investigations in this area had been suspended for a long time.

Zobnin discovered that these bases become finite if, instead of the lexicographic ordering, we consider other orderings of differential monomials. This fact revived the interest in this subject and initiated the study of orderings of differential monomials. (Received February 22, 2007)