1086-20-1527 **Atefeh Mohajeri Moghaddam***, mohajeri@math.mcgill.ca, and **Olga Kharlampovich**.
Approximation of Geodesics in Metabelian Groups.

It is known that the bounded Geodesic Length Problem in free metabelian groups is NP-complete, in particular the Geodesic Problem is NP-hard. We construct a 2-approximation polynomial time deterministic algorithm for the Geodesic Problem in free metabelian groups. We show that the Geodesic Problem in the restricted wreath product of a finitely generated non-trivial group with a finitely generated abelian group containing $\mathbb{Z}^2$ is NP-hard and there exists a Polynomial Time Approximation Scheme for this problem. We also show that the Geodesic Problem in the restricted wreath product of two finitely generated non-trivial abelian groups is NP-hard if and only if the second abelian group contains $\mathbb{Z}^2$. (Received September 23, 2012)