1086-68-1027 **Volker Diekert*** (diekert@fmi.uni-stuttgart.de), Universitaetsstrasse 38, 70569 Stuttgart, Germany. *Logspace computations in graph products.* Preliminary report.

We will show that certain group theoretic decision problems are robust under taking graph products in terms of logspace computability. Elder, Elston and Ostheimer asked if the word problem of a free product of groups having a logspace normal form is again in logspace. A solution was given for linear groups. Waack showed that the word problem of the free product $G * H$ is NC^1 reducible to the word problem of G, H and the free group on two generators. Therefore the question can be answered positively. We generalize this result to graph products of arbitrary groups with a word problem in logspace using Bass-Serre theory.

If moreover, in addition to the word problem, a normal form of the vertex groups can be computed in logspace, then we are able to compute normal forms in the graph product in logspace. (Received September 18, 2012)