Survey of appropriate matching algorithms for large scale systems of differential algebraic equations

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This paper presents a survey on matching algorithms which are required to translate Modelica Models. Several implementations of matching algorithms are benchmarked on a set of physical models from mechanical systems in ODE and DAE representation. The major part of algorithms is based on the Augmenting Paths Method and one algorithm is based on the Push-Relabel Method. The algorithms are implemented in the programming language C and MetaModelica. In addition two cheap matching algorithms are used to jump-start the advanced matching process.
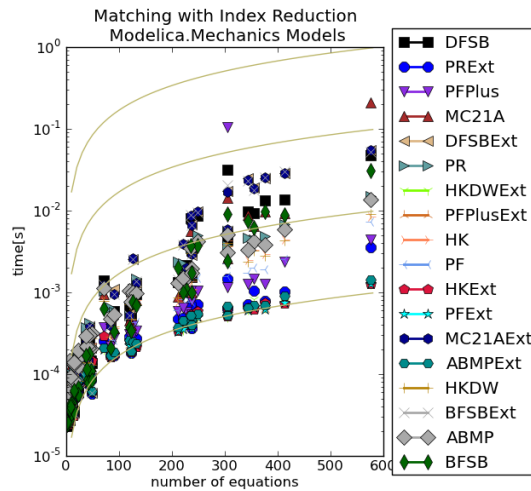
Figure 1: Results from Matching with Index Reduction for Modelica.Mechanics Example Models