

# From Scilab To High Performance Embedded Multicore Systems – The ALMA Approach

(Invited Paper)

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**Abstract**—The mapping process of high performance embedded applications to today’s multiprocessor system on chip devices suffers from a complex toolchain and programming process. The problem here is the expression of parallelism with a pure imperative programming language which is commonly C. This traditional approach limits the mapping, partitioning and the generation of optimized parallel code, and consequently the achievable performance and power consumption of applications from different domains. The Architecture oriented parallelization for high performance embedded Multicore systems using scilAb (ALMA) European project aims to bridge these hurdles through the introduction and exploitation of a Scilab-based toolchain which enables the efficient mapping of applications on multiprocessor platforms from high level of abstraction. This holistic solution of the toolchain allows the complexity of both the application and the architecture to be hidden, which leads to a better acceptance, reduced development cost, and shorter time-to-market. Driven by the technology restrictions in chip design, the end of exponential growth of clock speeds, and an unavoidable increasing request of computing performance, ALMA is a fundamental step forward in the necessary introduction of novel computing paradigms and methodologies.