

# A Configurable Framework for Stream Programming Exploration in Baseband Applications

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This paper presents a configurable framework to be used for rapid prototyping of stream based languages. The framework is based on a set of design patterns defining the elementary structure of a domain specific language for high-performance signal processing. A stream language prototype for baseband processing has been implemented using the framework. We introduce language constructs to efficiently handle dynamic reconfiguration of distributed processing parameters. It is also demonstrated how new language specific primitive data types and operators can be used to efficiently and machine independently express computations on bit-fields and data-parallel vectors. These types and operators yield code that is readable, compact and amenable to a stricter type checking than is common practice. They make it possible for a programmer to explicitly express parallelism to be exploited by a compiler. In short, they provide a programming style that is less error prone and has the potential to lead to more efficient implementations.