**Context**

**Standard Floating Point (FP)**

![Diagram of Standard Floating Point (FP)]

**High-precision Applications**
- Computational Chemistry
- Computational Physics
- Mathematical models

**Challenge**
- Enlarge the precision

**Variable Precision (VP) FP**

**Low-precision Applications**
- Embedded digital signal processing
- DNN: deep neural networks
- Computational geometry

**Challenge**
- Reduce the precision

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**SOA & Proposed VP FP Formats**

![Diagram of SOA & Proposed VP FP Formats]

**Variable Precision Core (VRP)**

The VRP is a RISC-V CPU based accelerator for extendable FP computation. It aims to facilitate the use of variable extended precision in order to improve the numerical stability of big linear algebra algorithms.

![Diagram of Variable Precision Core (VRP)]

**Benchmarking**

Run applications for each parameter configuration of each format

**High-precision application:** Gauss Elimination on a 100x100 Hilbert Matrix

**Low-precision application:** In-place FFT algorithm on a 8192 samples signal

This work has been performed in the context of the EPI project, which has received funding from the European Union’s Horizon 2020 research and innovation program under Grant Agreement EPI-SGA1: 826647.