

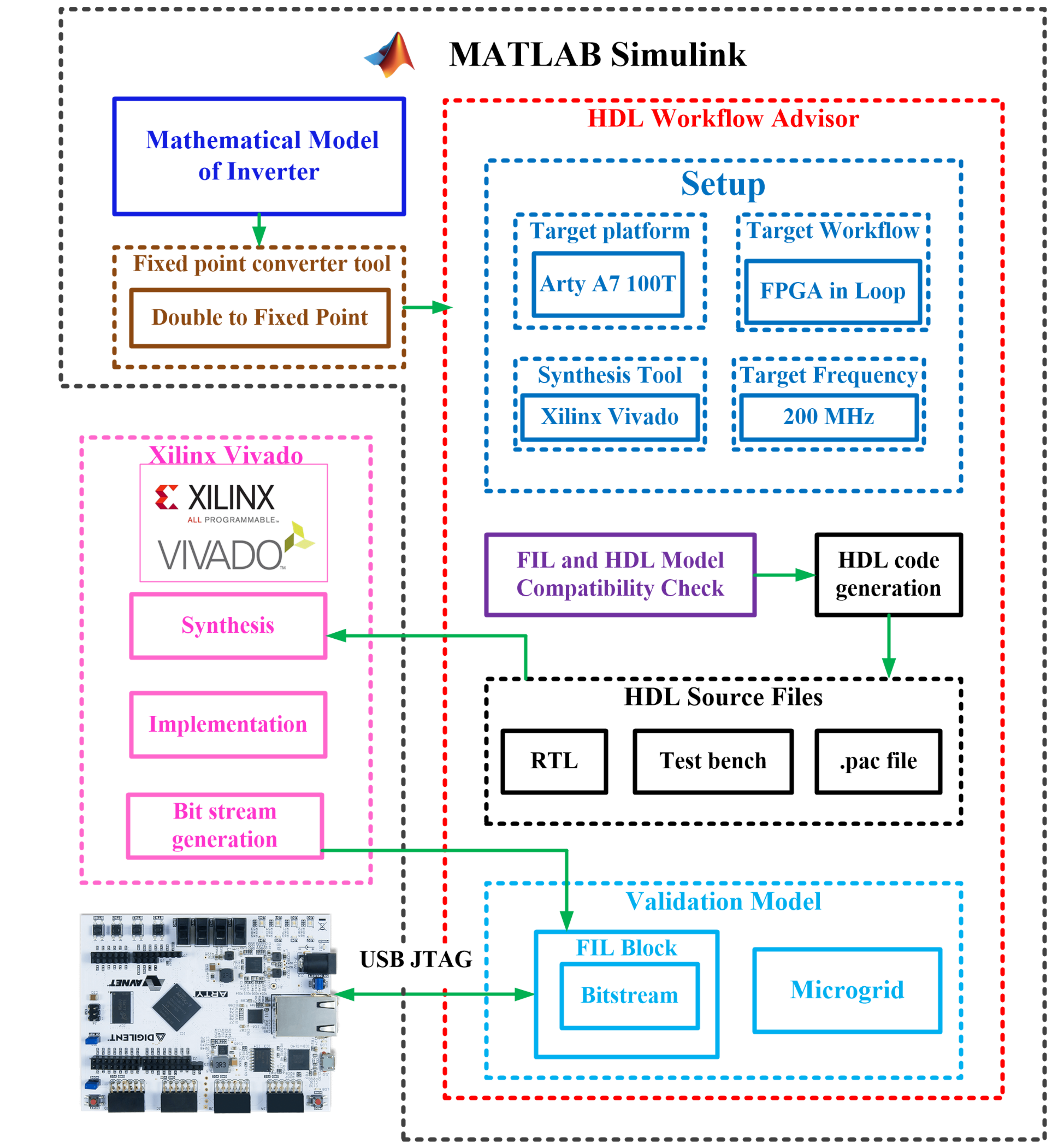
FIL Realization of Mathematical model of inverter using Arty A7 100T FPGA Board

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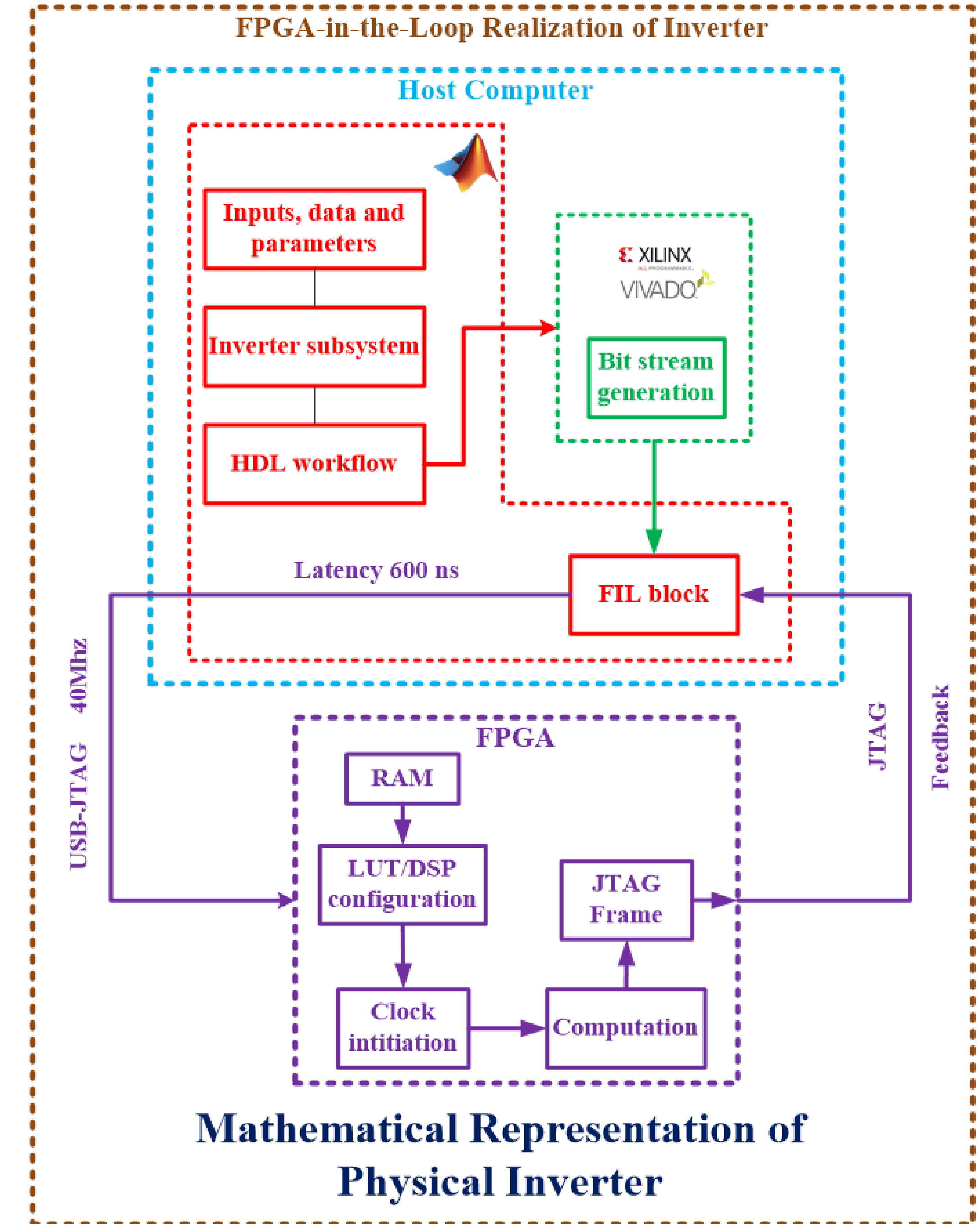
Abstract:

The continuous efforts in the development of the green energy options has resulted in the inverter rich grid, operating either in grid-following mode (GFL) or independent grid-forming (GFM) modes. As the traditional power grid already operates on various time scales the introduction of power electronics devices in operation of microgrid has resulted in fast dynamics and responses. In such circumstances having a reliable simulation platform becomes essential for design, testing, and validation of microgrids operation.

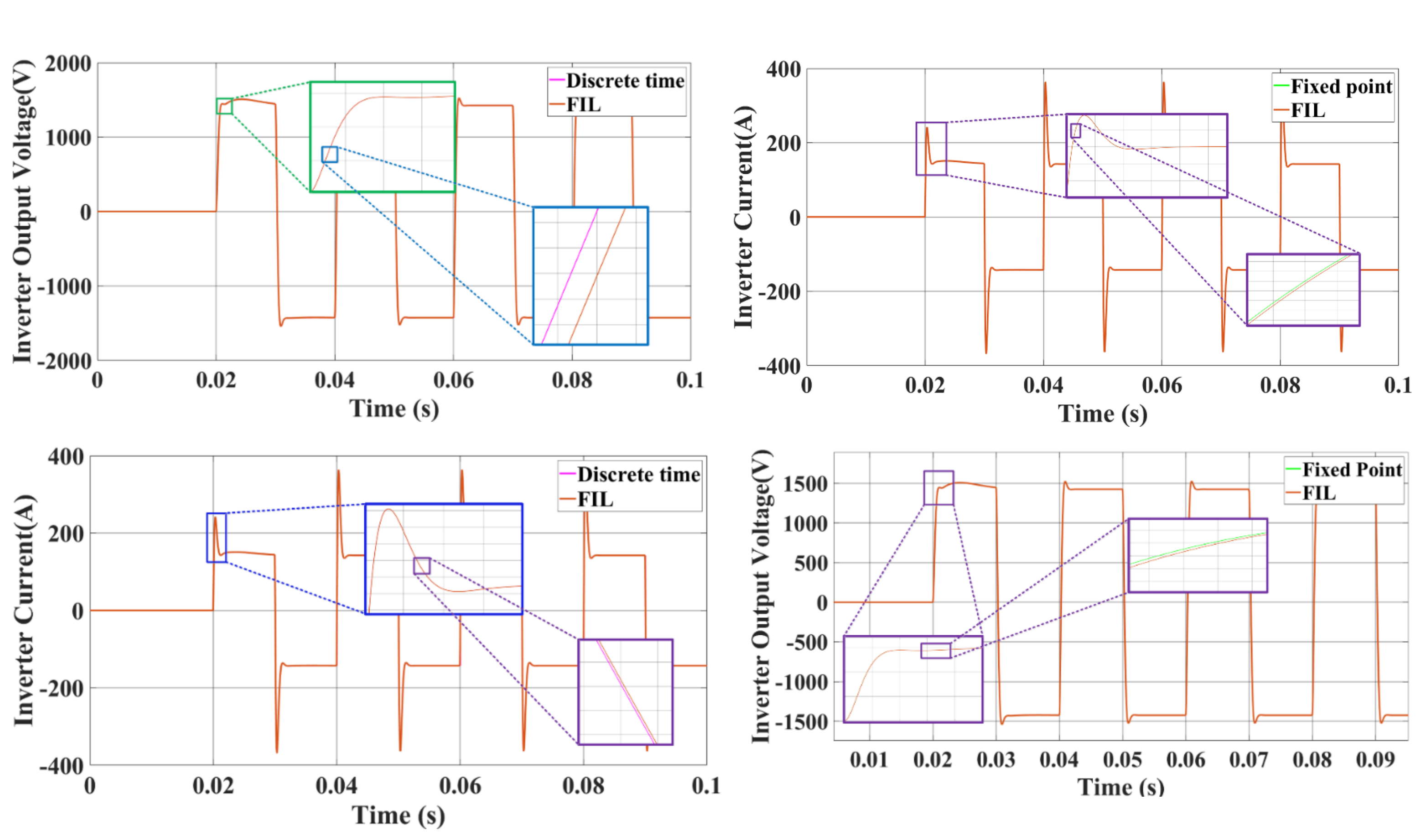
Simulink FIL Workflow



FIL realization of Inverter



Results:



Acknowledgement:

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 Poster based on papers accepted at FIL realization using FPGA – PESGM-2025 at Austin US.
 RT-FIL Analysis of Inverter- Empirical College UK

Conclusion:

- FIL closely matched SIL results with delay.
- Tested on an inverter connected to the grid.
- Portable and compact setup.
- Supports complex microgrid implementation.
- Eliminates the need for costly HIL or hardware setups.