Gravitational Wave Data Analysis Using Naked OpenCL

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A recent study was conducted on a data analysis pipeline of narrow-band, all-sky search algorithm targeting continuous gravitational wave sources. Our hypothesis was that the employed algorithm is bandwidth limited, moreover the initial choice of floating-point precision being far too generous; hence reducing precision on various parts of the pipeline could be done without losing much precision on the results. Meanwhile, the algorithm was also ported to using OpenCL in hopes of broadening our set of possible target architectures. This talk summarizes our findings, the confirmation of our hypothesis, and experiences in implementing a generic OpenCL pipeline as well as peaks into the future, aiming to making our code more robust by leveraging SYCL.