Research Plan Summary

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The measurement of u-bar and d-bar Sivers asymmetry in SpinQuest

I am planning to work on the FPGA trigger of SpinQuest. Successful trigger operation, which will be described in the follow, will be crucially aided by the Intensity Frontier Fellowship. I request the Intensity Frontier Fellowship to support my stay at Fermilab from March 2, 2020 to September 1, 2020 where my total stay at Fermilab is about 5-6 months.

The current FPGA trigger was developed and operated in the SeaQuest experiment. In the previous operation at SeaQuest, we had following observation and difficulties. First, most of background in triggered data came from the combinatorial single muons decayed from pions, produced at the beam interaction with the beam dump magnet. Due to course vertex resolution, the separation of the beam dump magnet from the target is diffcult in the triggering. Second, we had weird timing jitter of trigger, which we don't underatand. Third, we have higher background than expected in one of background FPGA trigger. However, since current FPGA trigger doesn't have function that saves any information of fired hit patterns, it makes dignosis difficult. Considering this issues, I present work plan for better performance.