

Abstract Submitted
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Hard scheduling problems for early quantum annealer ZHIHUI WANG, NASA Quantum Artificial Intelligence Laboratory; Univ Space Research Assn, TONY TRAN, BRYAN O’GORMAN, NASA Quantum Artificial Intelligence Laboratory, MINH DO, JEREMY FRANK, NASA Ames Research Center, ELEANOR RIEFFEL, NASA Quantum Artificial Intelligence Laboratory, NASA Ames Research Center, NASA QUANTUM ARTIFICIAL INTELLIGENCE LABORATORY TEAM, NASA PLANNING AND SCHEDULING GROUP TEAM — We present a parameterized family of single machine scheduling problem that exhibits an easy-hard-easy phase transition. As the parameter is varied, the problem goes through a fast transition from being almost trivial to find a solution to almost always has no solution, this sharp transition accompanies a peak in computational effort. While implementing realistic-sized problems on an early quantum annealing device is still a challenge in near future, using a benchmarking problem set of small size but in a well-defined hard family, one can gain insight to a how the solving time scales for the whole family.[1] We will report quantum annealing results on this and other related problems. [1] E. G. Rieffel, D. Venturelli, B. OGorman, M. B. Do, E. M. Prystay, and V. N. Smelyanskiy, Quantum Information Processing 14, 1 (2015).

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