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Jet reconstruction with quantum-annealing-inspired algorithms

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Jet reconstruction is a crucial component of reconstruction in high energy collider experiments. It is known for high consumption of computing resources, and various investigations are ongoing to cope with this challenge. This reconstruction task can be considered as a quadratic unconstrained binary optimization (QUBO) problem, which is suitable to be solved with quantum algorithms. I will resent recent studies on quantum-annealing-inspired algorithms, in particular the simulated bifurcation (SB) algorithms. They can handle significantly large data at high speed; e.g. as much as four orders of magnitude faster than the simulated annealing for the track reconstruction, demonstrated in our previous study. SB also provides promising performance on jet reconstruction, which will be the scope of this talk.

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