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Time-information at colliders

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We study the kinematics of long-lived particles which decay inside the detector using precision timing information. We consider the event with two long-lived particles which decay to visible and invisible particles. We reconstruct 4-momentum of long-lived particles as well as invisible particles by solving kinematic equations with and without the timing information. Without using the timing information, the kinematic equation is only solved in very special case. But using the timing information we can solve it in general cases. With this method, we can find out more information of long-lived particles at the collider.

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