

The contact mode rapidly fluctuates between $\{1\}$ and $\{2\}$ as the particle funnels towards the intersection. Because of this constraint switching, it is imparted impulse whenever it leaves a constraint. This causes Zeno paradox, where it is losing energy continuously but it can satisfy conditions for transfer into $\{1, 2\}$.

As it loses energy, post-impact velocity approaches zero, and it will enter contact mode slightly past the constraint.

Then with enough post-impact velocity to return to satisfy $a(g) = 0$, there are no more impact events and gravity pulls the particle down to the constraint.

As we reduce time steps, the algorithm approaches zero-paradox - ie- infinite transitions in finite time. But it eventually settles to steady state contact mode $\{1, 2\}$.

In the event based approach, it cannot handle this paradox and it breaks down.

However, the time-stepping algo also gives transitions that are not possible like $\{1, 2\} \rightarrow \{1\}$ and $\{1, 2\} \rightarrow \{2\}$.

This happens because we relaxed our constraints which do not include impulse forces over a time step.