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Enhanced shortcut to adiabaticity in internal Josephson Junction

We investigate the preparation of spin-squeezed states in internal Bosonic Josephson Junction, where the interaction strength of the states can be controlled.
This problem has already been treated using the technique called *Shortcut to Adiabaticity* (STA), albeit in an approximate version.
In this work we devise and implement a novel, enhanced STA type protocol called eSTA.
This purely analytical technique expands can be applied to the non-approximated version of the system yielding better fidelity and showing an improvement in the robustness against noise when compared to its STA counterpart.

This poster will outline the general derivation of the eSTA protocol and its application to the internal Bosonic Josephson Junction, as well as giving some outlook for future investigation.

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