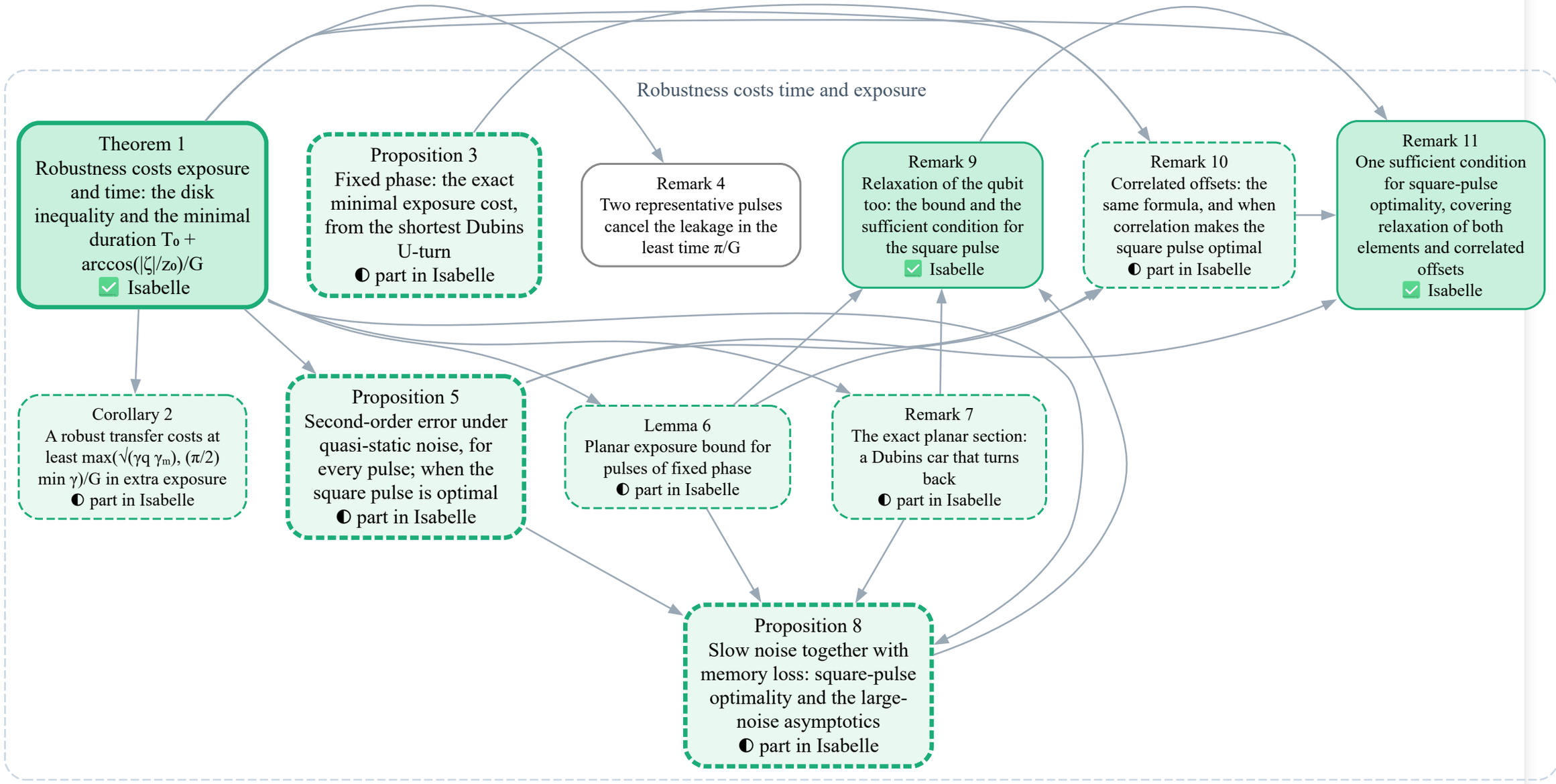
Map of *Robust qubit–memory transfer against quasi-static frequency noise costs time and exposure: exact bounds from Dubins curves*

11 results | ✅ **0** entirely in Lean | ◐ **7** partly in Lean | ✅ **3** in Isabelle | 💻 **0** checked by a program | written proof only | (a result can carry several tags)

Dependencies in the written proof: an arrow A → B means that this proof of B uses A. Every result rests on its written proof; the tags record what was checked besides, and each statement's "Evidence & scope" block says how far. The colour of a box is its strongest tag, in the order above; the tags in the box give the rest. Boxes with a thick border are the main results; click a box to read the statement.



🚀 **Start here: Theorem 1**: Robustness costs exposure and time: the disk inequality and the minimal duration $T_0 + \arccos(|\zeta|/z_0)/G$.

Main results:

- **Theorem 1**: Robustness costs exposure and time: the disk inequality and the minimal duration $T_0 + \arccos(|\zeta|/z_0)/G$
- **Proposition 3**: Fixed phase: the exact minimal exposure cost, from the shortest Dubins U-turn
- **Proposition 5**: Second-order error under quasi-static noise, for every pulse; when the square pulse is optimal
- **Proposition 8**: Slow noise together with memory loss: square-pulse optimality and the large-noise asymptotics