

# Gerhard Kirchmair, University of Innsbruck (QuCoS coordinator) - Coupling Fluxonium to a 3D circuit QED architecture - towards a dissipative cat qubit

*Thursday, 23 February 2023 10:00 (30)*

The aim of QuCoS is to encode a quantum bit in the fundamental bosonic mode of a weakly non-linear coaxial cavity[2] and protect it from decoherence with engineered two-photon dissipation [1]. In the case of this sub-project, the cavity non-linearity is inherited from a fluxonium qubit[3], which allows us to tune the memory-ancilla interaction in situ. As recently shown, in contrast to the conventional transmon ancilla, this qubit possesses higher protection against pump/readout induced decoherence. Furthermore, the larger anharmonicity of the fluxonium allows for faster gate operations on the qubit. Together with the engineered dissipation, this setup could be utilized as an improved building block for a fully protected logical qubit. More specifically, in this talk I will present progress of coupling a fluxonium qubit to a high coherence cavity. I will talk about the coherence properties of the high-coherence cavity, the design and fabrication of the Fluxonium qubit and how to get magnetic flux into a 3D circuit QED architecture.

## References

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