

Abstract Submitted
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Transport Characteristics of Self-Aligned Josephson Junctions Grown using co-Deposited Molecular Beam Epitaxy¹ GUSTAF OLSON, ALLISON DOVE, ZACHARY YOSCOVITS, CHRIS NUGROHO, VLADIMIR ORLYANCHIK, DALE VAN HARLINGEN, JAMES ECKSTEIN, University of Illinois Urbana Champaign — Low noise Josephson junctions are extremely desirable in SQUIDS and qubit circuits. Sources of flux noise and critical current noise can be reduced by using both clean, single crystal junctions to lower the density of fluctuators and by decreasing the size of the junctions to lower the absolute number of fluctuators. We report transport characteristics of small, single crystal Josephson junctions grown using a co-deposited aluminum-oxide barrier molecular beam epitaxy process. We also report a novel self-aligned fabrication process that allows us to produce sub-micron junctions from these single crystal films. We show that our co-deposited junctions have more ideal transport characteristics than those junctions grown with only a diffused barrier. -

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