

## Report on research projects under the IDEA League Student Grant

Personal information			
<b>Full Name:</b>		Hansjakob, Viola Orane	
<b>Field of study:</b>		Physics	
<b>Degree pursued:</b>		Master	<b>Current year of studies:</b> 6
<b>Home University:</b>		ETH Zurich	
<b>Sponsoring professor at home university</b>	<b>Name:</b>	Prof. Thomas Ihn	
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Information about the research stay			
<b>Host University:</b>		Chalmers tekniska högskola (Chalmers University of Technology) - Göteborg	
<b>Sponsoring professor at host university</b>	<b>Name:</b>	Prof. Per Delsing	
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<b>Dates of research stay</b>		<b>from:</b> 01.04.2016	<b>to:</b> 30.09.2016

Summary of the research project (200 words max.)
<p>My project was about the fabrication and characterization of a Cooper pair box (CPB) device placed at the end of a transmission line.</p> <p>The ultimate goal of this project will be to use the CPB as a qubit and drive Landau-Zener transitions to excite this qubit. Thereby single photons will be generated due to the spontaneous emission of the qubit. The aim is to have a source emitting broadband in the 4 to 8 GHz range.</p> <p>In order to characterize the CPB a coherent microwave signal was applied on the transmission line and the reflected signal from the CPB was analyzed. From various reflection measurements at 10 mK it was found that the device did not meet all criteria needed to be used as a single photon source. 1. the spectral line of the qubit was dominated by dephasing, which was mostly caused by low frequency charge noise. 2. the charging energy was lower as anticipated, such that the source would emit with frequencies around 1 GHz instead of between 4 to 8 GHz.</p> <p>For building a source emitting broadband in the 4 to 8 GHz range, the present work is used to improve the design of future devices.</p>

### **Experience report**

*Please tell us about your experience at the host university and give us an evaluation of the benefits of the research stay for the course of your studies*

A clear benefit of doing my research project at Chalmers was the opportunity to work in a very well equipped cleanroom which is not possible during the Master at ETH.  
I met very friendly and helpful people and found my self working in a group with a great atmosphere. My supervisor was very experienced and always keen to answer my questions.

### **Picture**

*Please provide a picture of you at the guest university*



The report should be signed by both professors involved. (The signatures will be deleted when the template is published on the IDEA League web page.)