

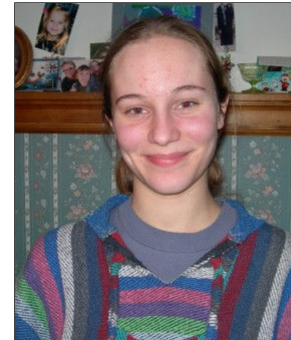
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Redesign of Alvin Electrometer for High Temperature In-Situ Chemical Sensors

This project outlines the work completed on a redesign of the electronics part of an electrometer. This one-of-a-kind device is used for studies of temperature and pH along undersea hydrothermal vents by University of Minnesota oceanographers Kang Ding and William Seyfried. The electrometer is a submersible unit consisting of circuit boards inside titanium housing. The housing is then connected to a high-impedance pH sensor. Unique to this sensor is the requirement that it operate reliably at ocean depths in excess of 1200 meters, interface with the DSRV Alvin and its high impedance nature. The electrometer must interface with the hardware on the DSRV Alvin. The current circuitry was designed and built a decade ago. It has experienced problems related to poor rework and space limitations. Also, because of extreme pressure at the bottom of the ocean, some connections fail. This warrants a redesign with newer, more energy efficient circuit components. This project exemplifies interdisciplinary research with a geological application, a chemical sensor, and electrical measurements.



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