ME121-001

HW3, Individual Assignment

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As we can see from the Schlumberger data set and corresponding plots, resistivity decreases with increasing salinity of water and with increased temperature of water. I obtained different values for resistance of our water column than hinted at in the homework, most likely due to different for length and area of the water column. Curiously, my groups own calibration data measured a resistance of roughly 6500 ohms at 500ppm for our sensor while we would expect a resistance of around 2600 ohms according to the Schlumberger data set. This could be to the geometry of the sensor or probes, or due to electrical signal offsets inherent in our system, or something else we haven’t thought of.

Attached are three plots:

Resistivity vs. Salinity

Resistance vs. Salinity

Analog Output vs. Salinity

I have also attached the functions used to create the plots. salinity\_model() is the main function, and it calls resistance\_data(), to import the Schlumberger data set, powfit() to fit the data, and voltage\_divider() to do voltage divider calculations to find analog output.