



# CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

<b>Name(s)</b> Ashley M. Bianco	<b>Project Number</b> <b>S0901</b>
<b>Project Title</b> <b>Common Electrical Appliances and the SID Monitor</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> To determine if common household electrical appliances with higher voltage disrupt my SID(Sudden Ionospheric Disturbance)monitor. The SID collects data on the effects of solar disturbances in the Earth's ionosphere. It is important to discover what common electrical appliances disrupt my monitor so that I may eliminate this disturbance and collect correct data.</p> <p><b>Methods/Materials</b> SuperSID monitor, Dell PC laptop with a sound card that records 96kHz, PVC piping, 120 meters of insulated wire, Coax Cable RG - 58, BNC connector, terminal block. Antenna: PVC pipes glued in shape of box with wire wrapped around. Coax cable attaches the terminal block and plugs into SID. Monitor configured with longitude, latitude, and time zone (discovered using Garmin GPS and verified on Google Earth). Isolated antenna and monitor to record clean interference free data (Verified by GOES Data as Control). I then tested each electrical appliance separately and recorded its effects.</p> <p><b>Results</b> Electrical appliances had an effect and caused either fluctuations or anomalies within the data. Electrical appliances with higher voltage created a greater effect. All data collected, measured, and graphed is displayed in report.</p> <p><b>Conclusions/Discussion</b> The biggest offenders were the fluorescent light bulbs, vacuum cleaner, and the microwave oven with a greater amount of voltage causing high spikes on the readout. Some of which could be considered fatal to the SID monitors ability to continue operation. Some did not generate much sound but enough noise to cause an interference because low voltage. The microwave had the biggest effect, because it uses radio waves and because microwaves use high frequencies which can cause fatal malfunctions to the highly sensitive monitor. Vacuum cleaner had an effect because of how loud its motor was and it used a medium amount of voltage. Furthermore, I found that voltage does have an effect upon the monitor, but other factors can cause disturbances. During testing, I found that sound cards play a big factor in your data. An AC97, which only records sounds at 48 kHz, this only added to the preamplifier. Overall, I was able to correctly identify the offenders and I will begin working on isolating and eliminating these disturbances so that I may further my research into Solar activity.</p>	
<b>Summary Statement</b> Testing the effects of common household electrical appliances with higher voltage on the SID monitor.	
<b>Help Received</b> mother provided glue, Stanford provided the SID monitor, Grandfather helped wire antenna.	