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The Investigation of Laser Ignited Plasma with the Application of Current Probes TREVOR OLSSON, JAMES AMOS, LASZLO UJJ, University of West Florida — Among a variety of atomic emission spectroscopy methods Laser-induced breakdown spectroscopy (LIBS) is the one which can analyze any solid, liquid or gas sample. The elemental composition and the relative abundance of the constituent elements in the samples can be determined when the emission spectra of short laser pulses igniting plasma is then recorded and analyzed(e.g.). In our studies we have made a LIBS system which includes, but is not limited to investigating the physical phenomena and properties of the emitting plasma. Active research is going on concerning Lithium-ion batteries to increase the stored charge and energy per volume properties of the device. LIBS is proposed to test the manufacturing process and analyze the chemical constituents of the newly developed batteries. The composition of the battery itself consists of two pieces of foil, typically aluminum and copper acting as a cathode and anode respectively. Separating these two pieces of foil is a lithium based compound. The general chemical composition is Lix [Metal]y Oz where [Metal] is the specific element that is used to achieve the purpose of the battery (one metal may increase the out-put while another helps with capacity etc.). We have chosen the Li-Ion battery composed of LiCoO2 from a mobile phone in order to investigate the Stark-effect (Stark shift and Stark broadening) of the lithium present in the sample. Effects of line broadening and reabsorption of the signals are addressed by recording LIBS spectra from the powder electrolyte extracted from a Lithium-ion battery.

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