**A VERSATILE PLATFORM FOR NEW ADVANCED TRANSIENT ELECTROMAGNETIC INSTRUMENTS**

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The top meters of the subsurface geological layers play a decisive role for many human activities. Agriculture takes place in the soil layers in the first meters, construction in the first tens of meters, mining in the first few hundreds of meters and groundwater is located and stored in the entire column from the surface to several hundred meters of depth. Technologies for imaging these layers are in rapid development yielding more accurate images at a higher resolution at a lower cost.

We have developed a new hardware platform for transient electromagnetic measurements. The objective is to make a versatile software and hardware platform which can be used in different types of instruments where the major difference is in the software configuration, boxing and power supply. The new platform will be used in low-cost systems for permanent monitoring of groundwater levels, single site sounding with low and high power, towed systems like tTEM and semi airborne systems.

The platform consists of a two-channel receiver board, a transmitter board and a power supply board. All boards are designed so they are about 8 x 10 cm in dimensions. The receiver samples the signals at 4 MHz, 18 bit and is synchronized with GPS. Because of the GPS synchronization the transmitter and receiver does not need a synchronization cable but can operate independently for semi airborne systems and for ground-based systems with one or more rowing receivers. The transmitter has a maximum power of 35 ampere which can be driven by up to 36 volts. In a tTEM system with a single turn transmitter loop (3x3 m2) it will turn off the current in 2 µs and in a 50 x 50 m2 loop, it is approx. 5 µs. Several transmitters can run simultaneously thus yielding even higher currents.

The platform is supplied with a software interface which is made open source. We believe this allows researchers to develop their own applications using the hardware platform but with their own control software solution. In the presentation we will demonstrate how this new platform can be used to make instruments for imagining groundwater resources and thus solve water problems in a changing climate.