

### **Siropulse: High-Resolution Sub-Surface Radar**

CSIRO's innovative radar system can probe distances from less than one centimeter to several meters and will pick up both metallic and non-metallic objects. CSIRO's involvement in radar technology has been built up over many years, culminating in the development of Siropulse. This sub-surface radar system is easy to use, but is based on powerful data collection technology and sophisticated processing and imaging software.

#### **Applications**

Siropulse is ideal for counter-terrorism applications including detection of explosive devices and other weapons that may have been buried within solid concrete structures.

Siropulse's low power output makes it ideal for covert sweeping for concealed devices including fine wires.

Because Siropulse can detect the presence or absence of reinforcing material, voids, or pipes in concrete, it can also be applied to structural health monitoring of:

- buildings
- bridges
- railway tunnels.

Siropulse can also investigate possible concrete cancer and be used in integrity characterization of road surfaces.

#### **The system**

Siropulse consists of a hand-held probe and a control box weighing less than two kilograms and carried in a customized shoulder bag. The transmitted power is only a few mill-watts (far less than the average mobile phone) and the unit will run for ten hours on standard video camera batteries.

#### **How it works**

Siropulse transmits high frequency electromagnetic pulses (from 200 MHz - 2 GHz) into the area being investigated. It detects echoes reflected either by objects buried within the background material or from the interface between different layers. Siropulse has been specifically designed to overcome one of the problems associated with conventional radar - detecting targets in the near field. Siropulse quickly and accurately picks up signals even during the pulse launch period when operating in differential mode. The innovative antenna arrangement removes uniform background signals allowing discrete objects of interest to become immediately apparent.



Siropulse, revealing what lies beneath in three-dimensions (3-D)

### **Visualizing the data**

Another problem typical of radar is difficulty interpreting data.

The Siropulse team is addressing this with data processing packages and software that generates a three dimensional image so it's easy to visualize what's going on beneath the surface.

---

### **Contact Information**

#### **Primary Contact**

#### **Mr. Bruce Fox**

Business Development & Commercialisation Manager, Lindfield

CSIRO Materials Science and Engineering

Phone: 61 2 9413 7727

Email: [Bruce.Fox@csiro.au](mailto:Bruce.Fox@csiro.au)

---

### **Location**

#### **CSIRO Manufacturing Science and Technology - Lindfield**

Bradfield Road

Lindfield 2070

Australia

PO Box 218

Lindfield NSW 2070

Australia