



## XVII<sup>th</sup> World Congress of the International Commission of Agricultural and Biosystems Engineering (CIGR)

Hosted by the Canadian Society for Bioengineering (CSBE/SCGAB)  
Québec City, Canada June 13-17, 2010



### **A TRIPLE-SENSOR HORIZONTAL PENETROMETER FOR ON-THE-GO MEASURING SOIL MOISTURE CONTENT, ELECTRICAL CONDUCTIVITY AND MECHANICAL RESISTANCE**

QINGMENG ZENG<sup>1</sup>, YURUI SUN<sup>1</sup>, PETER SCHULZE LAMMERS<sup>2</sup>

<sup>1</sup>South China Agricultural University, College of Engineering, China, [qmzeng@scau.edu.cn](mailto:qmzeng@scau.edu.cn)

<sup>1</sup>Y. Sun, [pal@cau.edu.cn](mailto:pal@cau.edu.cn)

<sup>2</sup>University Bonn, Department of Agricultural Engineering, Germany

#### **CSBE101339 – Presented at Section I: Land and Water Engineering Conference**

**ABSTRACT** Following the development of a dual-sensor horizontal penetrometer for the simultaneous measurements of soil moisture content (MC) and mechanical resistance (MR), an electrical conductivity (EC) sensor with a 4-ring-Wenner-array was incorporated into the cone of the horizontal penetrometer. Both laboratory calibration and field test were conducted, and the experimental results showed that the triple-sensor horizontal penetrometer could provide more soil physical information on a field-scale.

**Keywords:** On-the-go measurement, Triple-sensor horizontal penetrometer