



New instruments for soil physics class: Improving the laboratory and field seminars

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Teaching soil science and soil physics is an important part of the curriculum of many programs with focus on technical and natural sciences. Courses of soil science and namely soil physics have a long tradition at the faculty of Civil Engineering of the Czech Technical University in Prague. Students receive the theoretical foundations about soil classification, soil physics, soil chemistry and soil hydraulic characteristics in the course. In practical seminars students perform measurements of physical, hydraulic and chemical characteristics of soils, thus a comprehensive survey of soil is done in the given site. So far, students had the opportunity to use old, manually operated instrumentation.

The project aims to improve the attractiveness of soil physics course and to extend the practical skills of students by introducing new tasks and by involving modern automated equipment. New instruments were purchased with the support of the Ministry of Education, Youth and Sports of the Czech Republic under the project FRVS No. 1162/2013 G1. Specifically, two tensiometers T8 with multi-functional handheld read-out unit (UMS, GmbH) and manual Mini Disk Infiltrometer (Decagon Devices, Inc.) were purchased and incorporated into the course. In addition, newly designed MultiDisk the automated mini disk Infiltrometer (CTU in Prague) and combined temperature and soil moisture TDT sensor TMS 2 (TOMST[®], s.r.o.), were made freely available for soil physics classes and included into the courses.

Online tutorials and instructional videos were developed. Detailed multimedia teaching materials were introduced so that students are able to work more independently. Students will practice operating the digital tensiometer T8 with integrated temperature sensor and manual Mini Disk Infiltrometer (diameter disk: 4.4 cm, suction range: 0.5 to 7.0 cm of suction) and MultiDisk the automated mini disk Infiltrometer (see Klipa et al., EGU2014-7230) and combined temperature and soil moisture TDT sensor TMS2. The tutorials cover the measurements process from installation to the data processing. The introduction of new instruments into the courses is not only attractive for students but also useful in terms of gaining practical experience and new skills with advanced measurement devices for PhD students who participate on class teaching. Students will be able to use newly gain skills as well as the equipment for their projects and theses.

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