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## **A novel automatic minirhizotron system for root research**

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The root system – the hidden half - plays an important part in the carbon allocation and for the uptake of nutrients and water for the plants. Various techniques were developed to study root development. Soil and ingrowth cores give only estimates of standing root biomass and relative growth. The minirhizotron method, in contrast to destructive methods, permits the measurement of the fine root production, mortality and turn-over. The minirhizotron technique can be used to monitor the same root(s) over selected time intervals, which can vary from days to years. Fine root production and mortality can be estimated by combining data from minirhizotrons and soil cores. Seasonal changes in the root dynamic can be related directly to above ground production. Furthermore, minirhizotrons can provide qualitative information on root color, branching and mycorrhiza. We are presenting a new automatic minirhizotron system. Positioning of the camera and image acquisition are fully automatic and controlled by a computer. Transparent glass tubes with 135 cm length and 3 cm diameter are used for root observation in the lysimeter of the Drylab in Eberswalde. First applications of investigations of fine roots of trees will be shown.