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## On estimation of topsoil near-saturated hydraulic conductivity by mini-disk infiltrometer

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Disk infiltrometers are established as standard devices for measuring near-saturated soil hydraulic properties. The procedures for the determination of unsaturated hydraulic conductivity by means of mini-disk infiltrometers, proposed by Zhang (1997) and quite widely used in practical applications, is verified using forward and inverse numerical modeling of the three-dimensional axisymmetric flow below the infiltrometer disk. The analysis is performed for twelve soils, representing different textural classes, and for two soils representing typical Central European cambisols. The analysis shows that for the soils with van Genuchten parameter n larger than about 1.3 the original methodology delivers reliable results. However, for the soils with n < 1.3 (represented by the cambisols of interest) the procedure fails to predict the unsaturated conductivities correctly. The problem can be addressed either by extending the semi-empirical approach of the original methodology, or by applying a more robust inverse modeling approach.