

ADDRESS BY:

T.J. Kukkamäki
President of the International Association of Geodesy (IAG)
Finland

In the last century the limits of accuracy in geodesy were set by incompletenesses in instruments, while ambient factors had minor influence. Since then progress in instrument building has been so great that improvements in theodolites were no longer able to increase horizontal accuracy significantly, and the movements of the instrument stands and, especially, lateral refraction now have a greater effect on accuracy than incompletenesses in the instruments. This state of affairs was still more evident for trigonometrical height determination as vertical refraction markedly surpasses the defects of instruments.

Conditions in levelling have also reached this state. The invar rods and levelling instruments were completed to the extent that refraction now sets the limits of accuracy possible to be achieved.

Under these conditions, it was more fruitful to try to develop research on the effects of ambient factors than on the observation instruments themselves.

The situation changed essentially when electronic methods and instruments entered geodesy. These new instruments and methods soon reached accuracies that are, even some decades, better than those obtained by classical means. The problems of ambient factors, I mean here the refraction mostly, got characters completely different from the earlier.

Along a side vertical and lateral refraction, longitudinal refraction entered the picture, especially in electronic distance measurement, EDM.

Research into refraction in the old sense is still going on. Research in the new sense consists of vertical, lateral and longitudinal effects. Longitudinal refraction is considered to be belonging to the EDM techniques and methods, and thus is to be treated in those connections.

Vertical and lateral refraction are the subjects of this symposium. This question is very important for improving the accuracy of classical geodetic measurements. As the classical data in most disciplines form

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the fundamental basis for both classical and modern measurements, these studies are very important for geodetic science as a whole.

The refraction in astrometry goes far beyond my knowledge. I do know however that it is very important for astronomical geodesy in a vertical and a lateral sense, and for space geodesy in a vertical, a lateral and a longitudinal sense.

The International Association of Geodesy and the International Astronomical Union are co-sponsoring this symposium, which is expected to give valuable results to both for these sciences, geodesy and astrometry.

On behalf of the IAG, I would like to thank our Swedish hosts, especially professor Tengström, for the invitation to this meeting. I wish its work the best success.