Experimental study of the possibility of sky-polarimetric viking navigation

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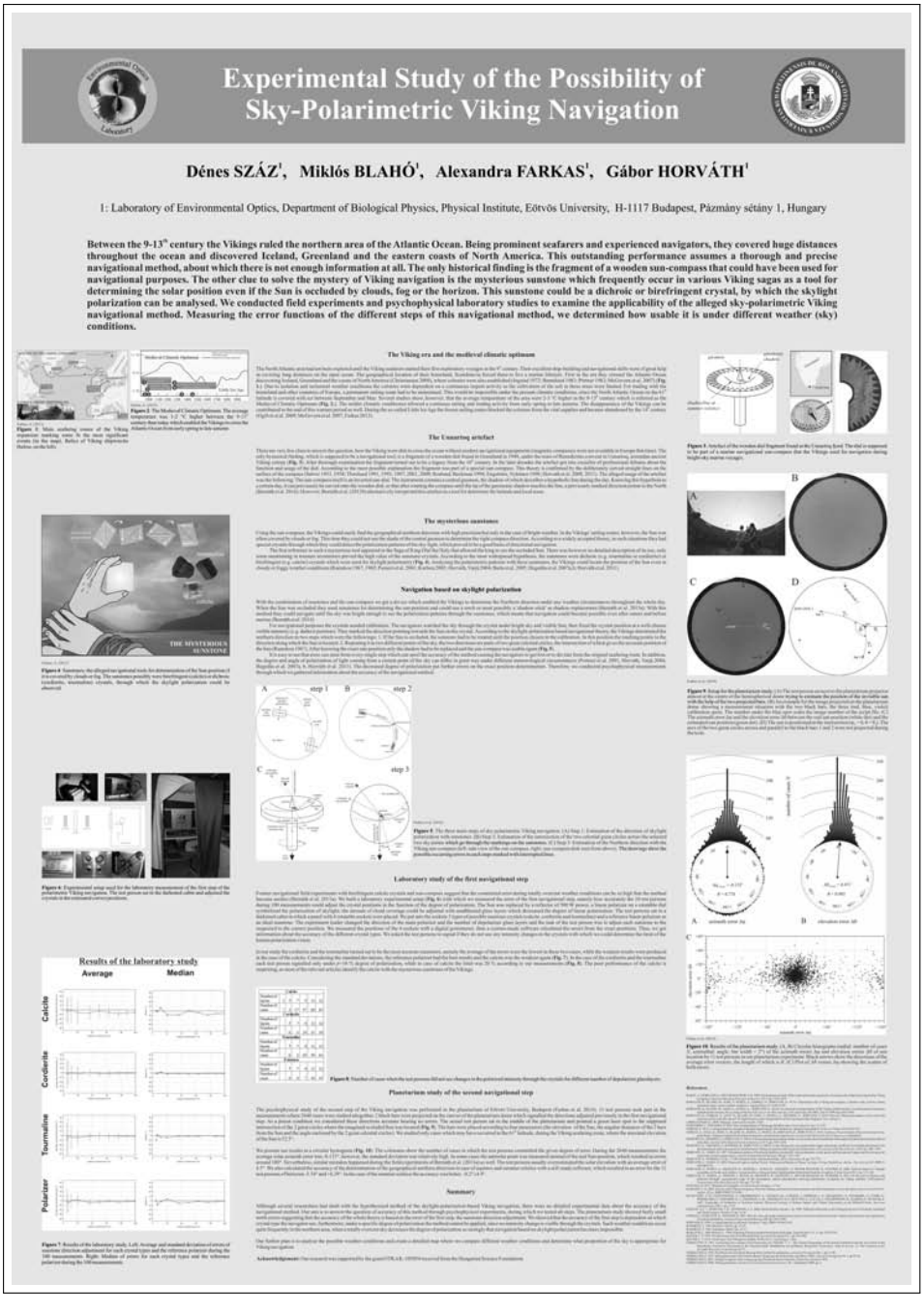
Abstract

Between the 9-13th century the Vikings ruled the northern area of the Atlantic ocean. Being prominent seafarers and experienced navigators, they covered huge distances throughout the ocean and discovered Iceland, Greenland and the eastern coasts of North America. This outstanding performance assumes a thorough and precise navigational method, about which there is not enough information at all. The only historical finding is the fragment of a wooden sun-compass that could have been used for navigational purposes. The other clue to solve the mystery of Viking navigation is the mysterious sunstone which frequently occur in various Viking sagas as a tool for determining the solar position even if the sun is occluded by clouds, fog or the horizon. This sunstone could be a dichroic or birefringent crystal, by which the skylight polarization can be analysed. We conducted field experiments and psychophysical laboratory studies to examine the applicability of the alleged sky-polarimetric Viking navigational method. Measuring the error functions of the different steps of this navigational method, we determined how usable it is under different weather (sky) conditions. In our talk we summarize our results in this topic.



Experimental Study of the Possibility of Sky-Polarimetric Viking Navigation

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Between the 9-13th century the Vikings ruled the northern area of the Atlantic Ocean. Being prominent seafarers and experienced navigators, they covered huge distances throughout the ocean and discovered Iceland, Greenland and the eastern coasts of North America. This outstanding performance assumes a thorough and precise navigational method, about which there is not enough information at all. The only historical finding is the fragment of a wooden sun-compass that could have been used for navigational purposes. The other clue to solve the mystery of Viking navigation is the mysterious sunstone which frequently occur in various Viking sagas as a tool for determining the solar position even if the Sun is occluded by clouds, fog or the horizon. This sunstone could be a dichroic or birefringent crystal, by which the skylight polarization can be analysed. We conducted field experiments and psychophysical laboratory studies to examine the applicability of the alleged sky-polarimetric Viking navigational method. Measuring the error functions of the different steps of this navigational method, we determined how usable it is under different weather (sky) conditions.

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