

ISSUE: 05. OPERATIONAL APPROACHES, EQUIPMENT AND PRODUCTS FOR WINTER CONDITIONS

SUB-ISSUE: Management of winter operations

Session: ()

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Room:

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Presentation title:

MONITORING METHOD OF SPATIAL THERMAL DISTRIBUTION FOR WINTER ROAD MAINTENANCE USING INFRARED THERMOGRAPHY

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Summary:

Road freezing in winter can lead to severe road accidents and traffic impediments. Therefore road administrators must constantly be aware of road temperature distributions. On major national highways, thermal mapping using radiation thermometers is already being implemented, making a big impact on road maintenance management. However, thermal mapping mainly gives vertical profiles. There are limited case studies on spatial temperature distributions considering horizontal profiles and with added surrounding environments (for example, snow accumulation on slanted surfaces, constructions and surrounding terrain). This research provides valuable information to road maintenance in the winter period. We are developing a spatial thermal distribution monitoring method using commercial thermography for the winter period in a model area. Infrared thermography is widely used as a non-contact temperature measurement technique in experimental fluid mechanics and heat transfer. The infrared cameras acquire an image that represents the thermal radiation emitted in the IR band from the observed surface; temperature is then obtained by means of a calibration law. This abstract shows numerical examples of spatial temperature distribution. Figure 1 is a frozen slope, and figure 2 is a junction with road heating. In either case, it is difficult to capture the temperature distribution from the visible image. However, using thermography, the spatial temperature distribution in local areas can be measured and recorded. This method will be limited to specific areas. However it is an effective measurement method for sections with frequent incidents (such as junctions and bends).

