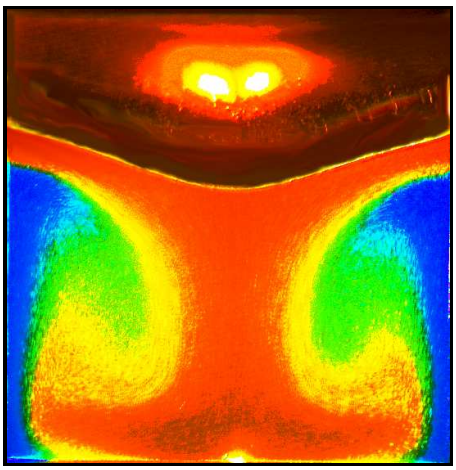
Frontispiece in Journal of Visualization, Vol. 1, no. 4, 1999, p. 335.

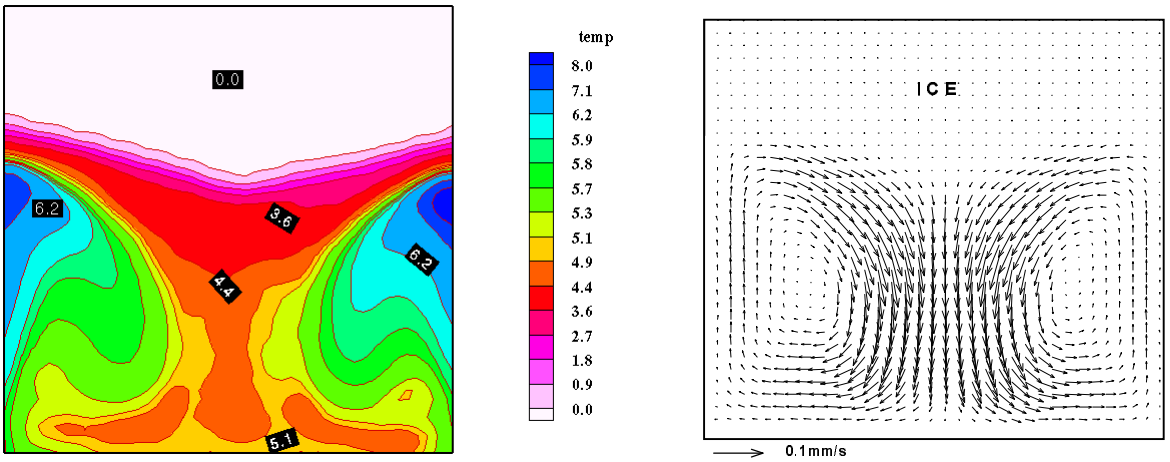
Tittle: Particle Image Velocimetry and Thermometry in Freezing Water

Authors: Tomasz A. Kowalewski, Andrzej Cybulski
Affiliation: Polish Academy of Sciences, IPPT PAN, Swietokrzyska 21, PL-00049 Warsaw, Poland; http://www.ippt.gov.pl/~tkowale/

Ice crystal growing from the top in a lid cooled cavity. Thermochromic Liquid Crystals are used as tracers to evaluate both the temperature and velocity flow fields. A plexiglas cube is immersed in an external water bath of temperature +20°C. The isothermal metal lid has temperature -10°C. Flow is observed at the centre vertical plane of the cavity. Figure illustrates flow circulation with a cold stream along the cavity axis (red colour response of the TLCs) and a warm reverse flow along side walls (green to blue colours of the TLCs). Analysis of the tracers colour allows to evaluate the temperature field (b). Cross-correlation performed for a sequence of 2-5 images is used to evaluate the flow velocity field (c).



(a)



(b) (c)