

TESTS OF THE EMISSIVITY AND SNOW ACCUMULATION  
ON SOUTH POLE TELESCOPE (SPT) PRIMARY MIRROR  
TEST PANELS

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Test panels with a variety of surface treatments have been placed in a test setup at the South Pole Station to characterize the surfaces for use in the primary mirror of the South Pole Telescope (SPT). Tests carried out at the South Pole include power required to raise the panel temperature and observations of the effect of snow buildup and snow clearing with panel temperature and heating. The test panels are manufactured of milled aluminum, similar to the planned SPT panels and have various candidate mirror surface preparations. The tests show that heating requires on average about  $55 \text{ W K}^{-1} \text{ m}^{-2}$  under average wind conditions. Photographs of the panels also show that heating the panels by 1K significantly reduces the accumulation of snow on the panels and speeds the clearing after a snow storm. For the SPT a waste heat input of 15 KW into the primary mirror will keep the primary clear except for intervals of a day or so after heavy snow accumulation conditions.

The test panels were exposed to the sun for part of the testing both before and after the 2004 austral winter. The temperature rise from solar heating depends on the surface treatment and is important for setting the panel gaps to prevent panel interference.

A second set of test panels with the same surface treatments have been tested in the lab to determine the mm and sub-mm emissivity of the surface treatments. The panel thermal emission is compared to that of a bare milled aluminum surface in 30% wide bands from 90 to 450 GHz.

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1. (a)

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2. J - Radio Astronomy

3. (a)

4. I - Invited Paper, Program  
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5. FOR SESSION: "Mirror  
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