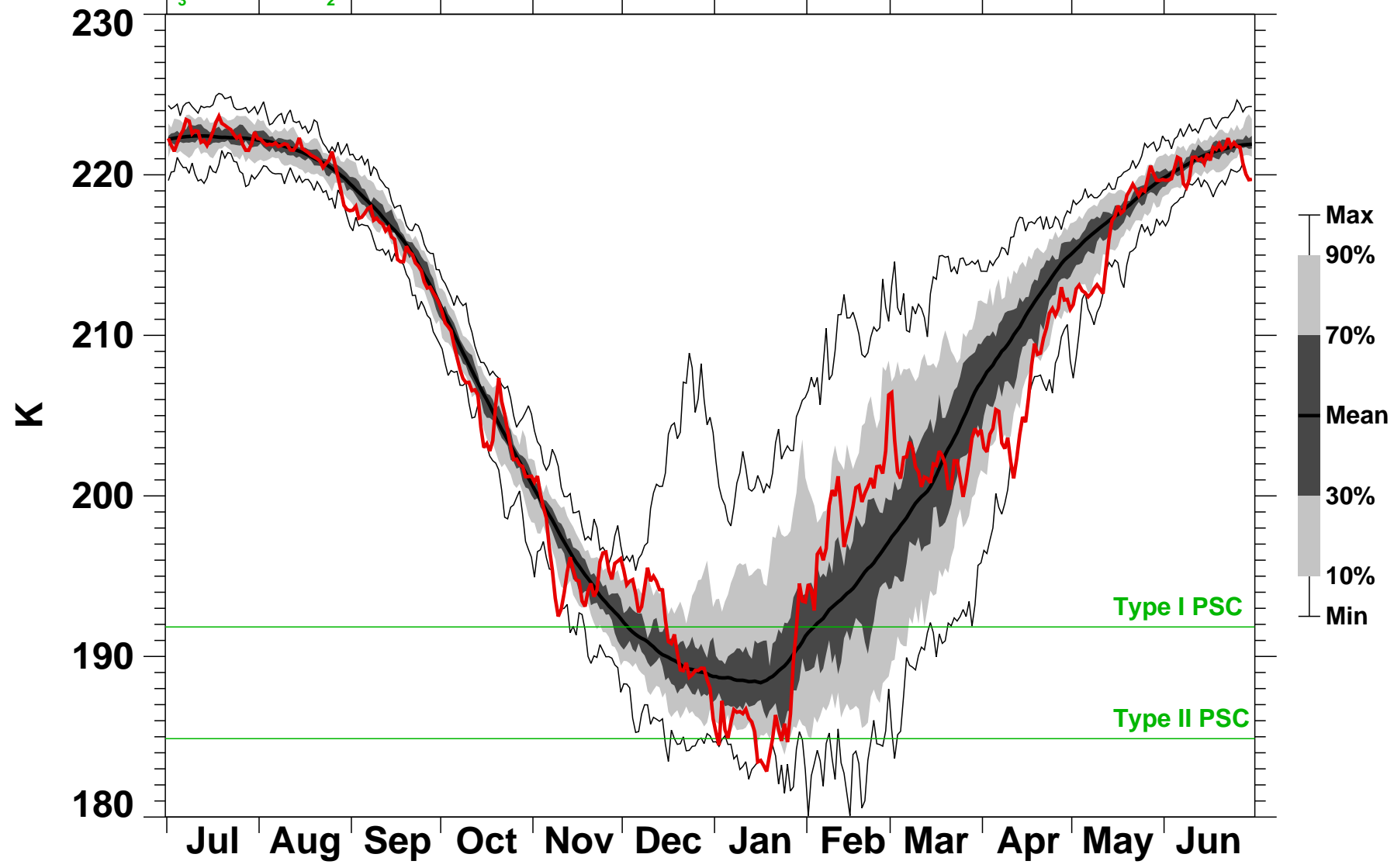


# 50-90°N Minimum Temperature

$\text{HNO}_3 = 6 \text{ ppbv}$ ,  $\text{H}_2\text{O} = 4.5 \text{ ppmv}$

30 hPa MERRA



1978/1979-2011/2012

2009/2010

P. Newman (NASA), E. Nash (SSAI), S. Pawson (NASA)