**Climate
of the Past
Discussions**

Interactive
Comment

Interactive comment on "A nonlinear method for detecting climate mutation: a case study for summer climate change in China" *by* S. Q. Wan et al.

Anonymous Referee #3

Received and published: 24 February 2009

The paper sets out to apply a nonlinear method to diagnose the climate shift in the 1960s and its effects on China. While I am quite familiar with the 1970s shift, the techniques and methods applied here are not familiar to me, and are very difficult to understand from the ms. Therefore my first main recommendation is that the ms needs substantial improvement in clarity, much more explanation of what is done, how, and how this relates to other research in the area, and much improved language (I recommend that the authors find a native speaker or a collegue publishing in a English speaking country for help). As it stands, it is very difficult to assess the ms. Some further comments:

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

Section 1: What is a 'climate mutation' - is this a technical term referring to something specific and different from climate change? If yes, then please explain. If no, then I would strongly disagree with the view that 'the dynamical processes and mechanisms of change are largely unknown' - they are subject of active research! The authors should try to set the context for their work in more detail than general climate change, and describe more what they are trying to do thats new and different. Also, the shift in the 1970s is generally linked to a change in Pacific Decadal variability, and there is huge amounts of literature (maybe check Trenberth et al., 2007 IPCC WG1 report Chapter 3) about it, should be connected to.

eqn 1) seems to be just a timeseries, unless I am missing something?

eqn 3: what is the meaning of self-correlation? This concept is not widely used in mainstream climate research and could use a bit more explanation, and maybe explain what the benefits are compared to the much more widely used autocorrelation

right before eqn. 4: the definition of s_m makes no sense - please check, maybe something got lost in latex.

Figure 2: Its a bit hard for a reader to decipher what is being said. What I seem to understand is that the nonlinear analysis identifies the same wavetrain of change in the 1970s transition for temperature and precip, while analysis of changepoint or change in mean does not pick up the same wavetrain but different blotches of change. This could potentially be very interesting. It begs the question though what is it that the Q_{xy} analysis picks up that the simple analysis misses? If you analyze a different timeperiod with no 'jump' what do you get then? is the wavetrain identified unusual relative to what you get if you identify just any two timeslots, or the regular response to any mechanism? how exactly do the results link to figure 4?

Therefore, I think the ms has potential, but needs lots of improvement

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

Interactive comment on Clim. Past Discuss., 4, 1047, 2008.