

On the Natural Component of Climate Change

Syun-Ichi Akasofu¹ and Hiroshi L. Tanaka²

1: International Arctic Research Center, University of Alaska Fairbanks, USA

2: Center for Computational Science, University of Tsukuba, Japan

Abstract

Climate change consists of both natural change and man-made change. However, as far as global warming is concerned, it is not possible to identify and determine the man-made component without subtracting the natural component from observed temperature change. As a first approximation, one of the methods to infer the natural component is to learn the past climate change. Based on the past temperature change and various past natural phenomena (including the retreat of glaciers), it is shown that the temperature change from about 1850 to 2017 can be understood mostly in terms of the combined effect of a linear increase of $0.5^{\circ}\text{C}/100$ years (probably, “recovery” from the Little Ice Age [LIA]) and a quasi-periodic oscillation (probably, the Pacific Decadal Oscillation [PDO]). The reason for the predicted high temperature in 2100 and the failure of predicting the present halting of global warming (2000-2017) may partly due to the lack of efforts of subtracting the natural component. It is urged to learn causes of the past climate change first before predicting future change.