
: TOTO 對 DOROTHY

In-Situ Observation of Tornado: TOTO vs. DOROTHY

Seon K. Park

Hydrometeorology Laboratory, Department of Environmental Science and Engineering,
Ewha Womans University, Seoul, Korea
E-mail: spark@ewha.ac.kr

Abstract

A short review on TOTO (TOtable Tornado Observatory), one of the earliest in-situ observing systems for tornado, is provided. TOTO was outfitted with sensors for measuring wind, pressure and humidity, and storm researchers, in mid-1980's, tried to put it inside tornadoes for detailed studies on tornado, but failed. However, the accumulated knowledge and experience with TOTO lead to a successful field program in mid-1990's. A story about DOROTHY, a parody of TOTO in the movie "Twister!", is also provided.

Key words: tornado, in-situ observation, TOTO

1.

(tornado) 가 (Suzuki et al., 2000), 가 (2004) 가 가 tronada(thunderstorm) (1965) 가 가

가 가
 (in-situ observation) ()
 “ Twister!”

“ Dorothy” 가

2. (Storm Chasing)

(Great Plains)
 (tornado alley)
 가

가

3. - TOTO

National Severe Storms Laboratory(
 NSSL) University of Oklahoma(OU)
 1972

4

(4 ~ 5) . 1980

가 가 “
 (heart of tornado alley) ”

OU Bluestein
 NSSL-OU

가 가 “ Twister!”(twister tornado)
 (storm chaser)

“ TOTO (TOtable Tornado
 Observatory)”

TOTO 250-350 lb(110-160kg)

(Fig. 1). “ Torable”

” 가 “ tote”

가

“ tote”

“ to carry, especially with difficulty ”



Fig. 1. TOTO outfitted with a variety of weather instruments – anemometers, pressure sensors and humidity sensors. Form NOAA (2004).

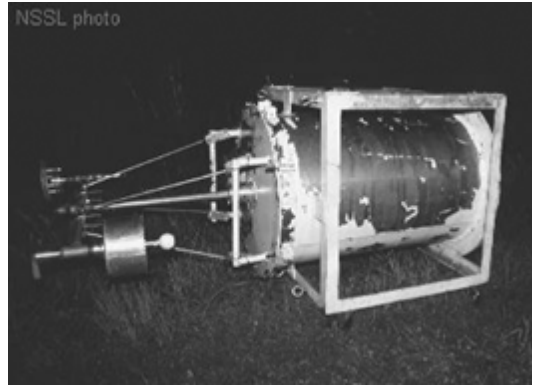


Fig. 2. TOTO fallen down (photo, bottom left) while being sideswiped by the edge of a week tornado at Ardmore, Oklahoma, U.S.A on April 29, 1984. From NOAA (2004).

(Longman, 1987). , “ ”
 TOTO
 가 . TOTO
 가 30
 4 ~ 5 (Miller,
 1987).
 TOTO
 가 . 1984 4
 가 TOTO
 가 (Fig. 2).
 가 1987
 “Twister!”
 TOTO
 DOROTHY

TOTO DOROTHY
 “Wizard of Oz”
 Dorothy Oz
 Dorothy
 Toto
 , “ Twister!” TOTO
 “Wizard of Oz” Toto
 Dorothy
 TOTO
 DOROTHY
 F5
 . TOTO가 가
 가

가 가 TOTO

가

가

4. 가 , 1965: 1945 9 13 Tornado . 가 , 1, 1-8. , 2003: 2002 가 , 13 57-70.

1970

. 1980

TOTO

, 2004: . Proc- eedings, 2004 , 216-217.

Longman, 1987: Longman Dictionary of Contemporary English, 2nd Ed., Longman Group UK Limited, 1258 pp.

Miller, P., 1987: Tornado! National Geographic, 171, 691-715.

NOAA, cited 2004: TOTO: TObable Tornado Observatory. Available online from <http://www.spc.noaa.gov/faq/tornado/toto.htm>.

Rasmussen, E. N., J. M. Straka, R. Davies-Jones, C. A. Doswell III, F. H. Carr, M. D. Eilts, and D. R. MacGorman, 1994: Verification of the Origins of Rotation in Tornadoes Experiment: VORTEX. Bull. Amer. Meteor. Soc., 75, 995-1006.

Suzuki, O., H. Niino, H. Ohno, and H. Nirasawa, 2000: Tornado-producing mini supercells associated with Typhoon 9019. Mon. Wea. Rev., 128, 1868-1882.

가 가 TOTO

10 VORTEX (Verification of the Origins of Rotation in Tornadoes EXperiment; Rasmussen et al., 1994)

(: (Korean Enhanced Observation Period: KEOP); , 2003)