Balloon Observations of Earth, Moon & Total Solar Eclipse

Jim Elkins
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Story will appear in Sky & Telescope October 2013 issue

Australian Total Eclipse 13 November 2012

Permission to use video and stills from Florin Mingireanu

Group of Australian and Romanian scientists launch a balloon to 120,000 ft

Almost didn’t have enough helium. Had to remove backup camera.

1 gram of lift per liter of helium.
Total Solar Eclipse of November 13-14, 2012

Begin of partial phase of eclipse (first contact) 20:00 UT = 4:00 AWST = 4:30 ACST = 5:30 ACDT = 5:00 AEST = 6:00 AEDT = 8:00 NZDT

Map by Michael Jöhn, September 2011, www.eclipse-map.com

Eclipse images by Kerrie Jöhn, visualiser free R
See YouTube Video at http://www.youtube.com/watch?v=W_9eYcG1T88 or Google Australian Eclipse from Balloon on YouTube.
Colorado Continental Divide

2013 © Patrick Cullis
Denver Boulder
NOAA SkyWisp UAS Configuration

- Glider plus payload (3) from Southwest Research Institute (SwRI), San Antonio, TX.
- Ground Station (2)
  - GlideTerm Software
  - Trackable Antenna System
  - Glider Comms System
  - Manual RC System
- Launching System
- Launching Supplies

Fred Moore, Co-I, with SkyWisp
Typical SkyWisp NOAA Flight Profile

- Ascent ~1 hour
- Optional Float (shown 18 hours)
- Descent 1-5 hours

Altitude (kft)
- 0
- 20
- 40
- 60
- 80
- 100
- 120

Time (hours)
- 0
- 5
- 10
- 15
- 20
- 25
SkyWisp is produced by Southwest Research Institute (SwRI)
NOAA Aircore

- U.S. Patent No. 7597014 (10/6/2009) by Pieter Tans NOAA/GMD

- First design was 150 m x 1/4” SS tubing, Smaller now.

- Weighs ~ 16 lbs.

- Launched locally by balloon.

Photos from Anna Karion and Colm Sweeney
Combine Radiosonde (left) and Ozonesonde (right) Into SkyWisp

GC used for analysis
Total solar eclipse of 21 August 2017

Wyoming
Proposal

• LAS launch a balloon with a radiosonde for outreach.

• The eclipse is 4 years away, plenty of time to get $500 to $1K to launch a balloon with cameras and sensors.

• Get local sponsors and place their logos on the balloon hardware that is videoed.
Eclipse shadow from Space (ISS) in 2006
Thanks for listening

Questions

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