

50th Anniversary Celebration of Both Apollo 11 Active Experiments: Passive Seismometer & Dust Detector Temperatures over 21 days

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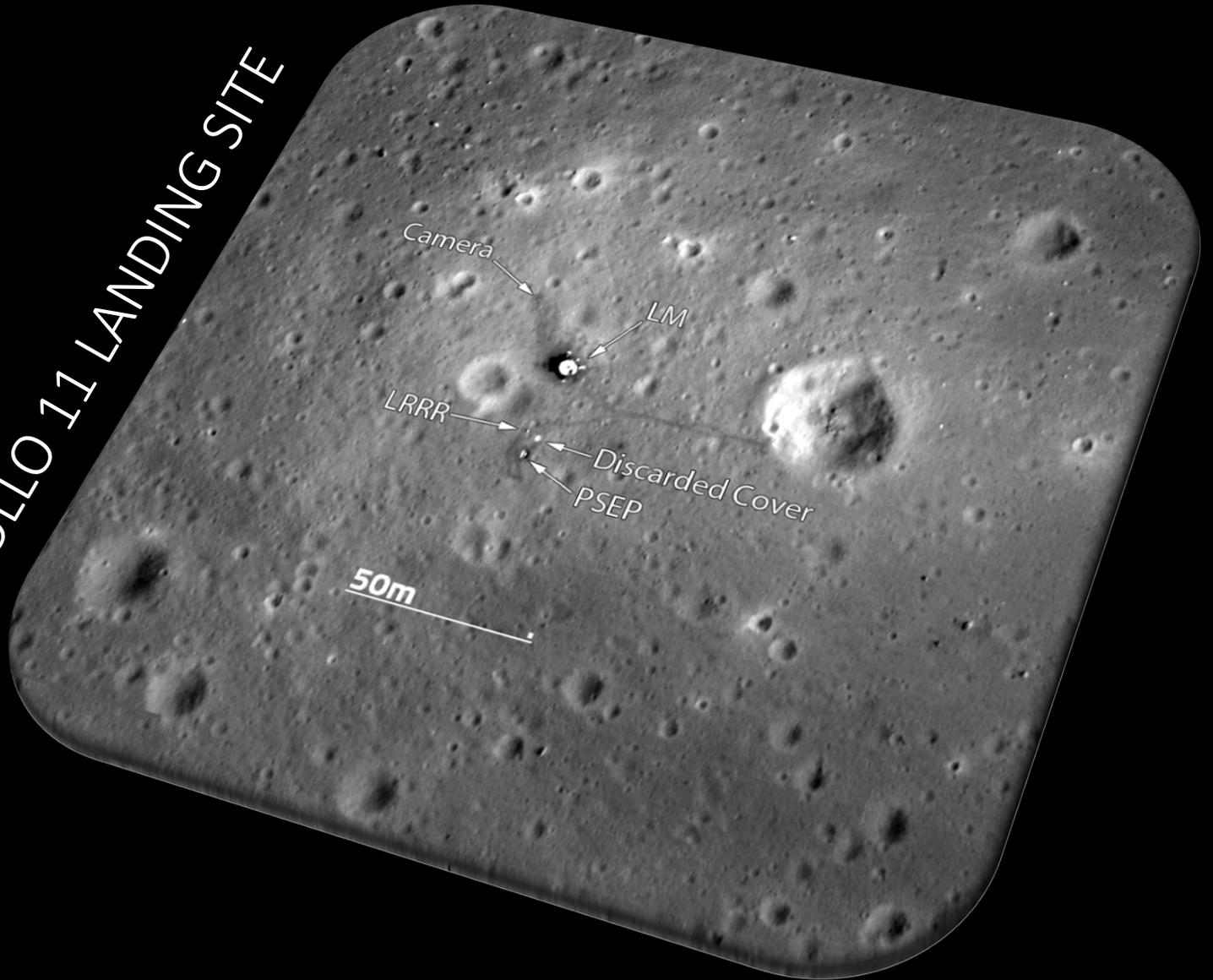
¹ In July 1969, Professors O'Brien and Latham were Principal Investigators for the only two Apollo 11 active (powered) experiments; the Dust Detector Experiment (DDE) and the Passive Seismic Experiment (PSE), respectively.

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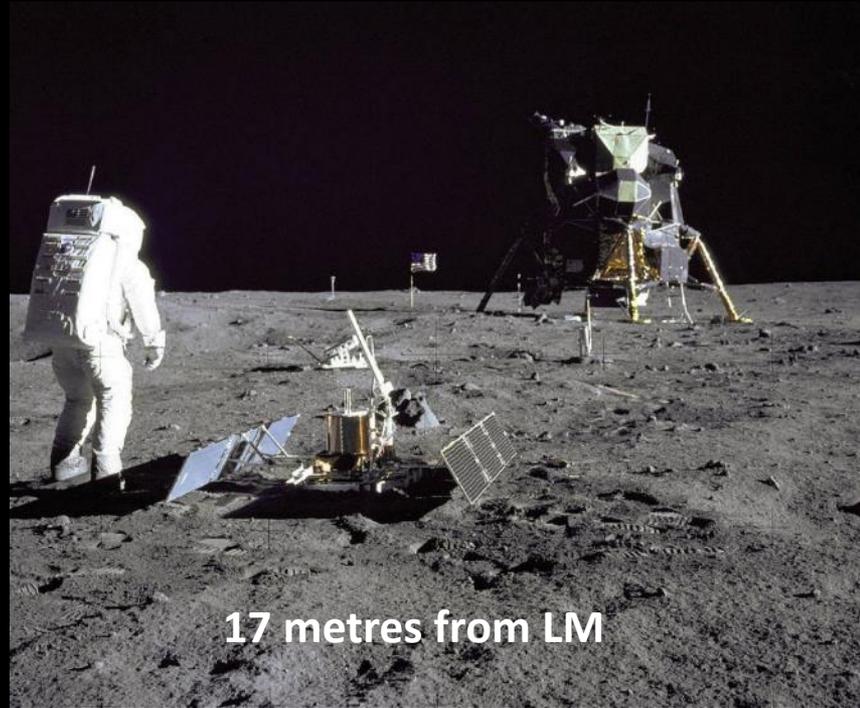
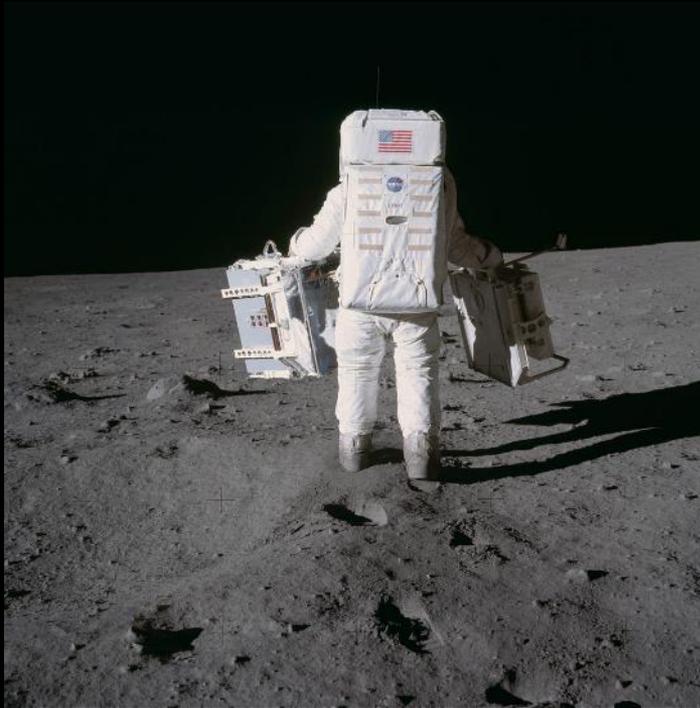
³ The University of Texas at Austin, USA.

⁴ Tape Ark Global HQ, Perth WA, Australia.

APOLLO 11 LANDING SITE

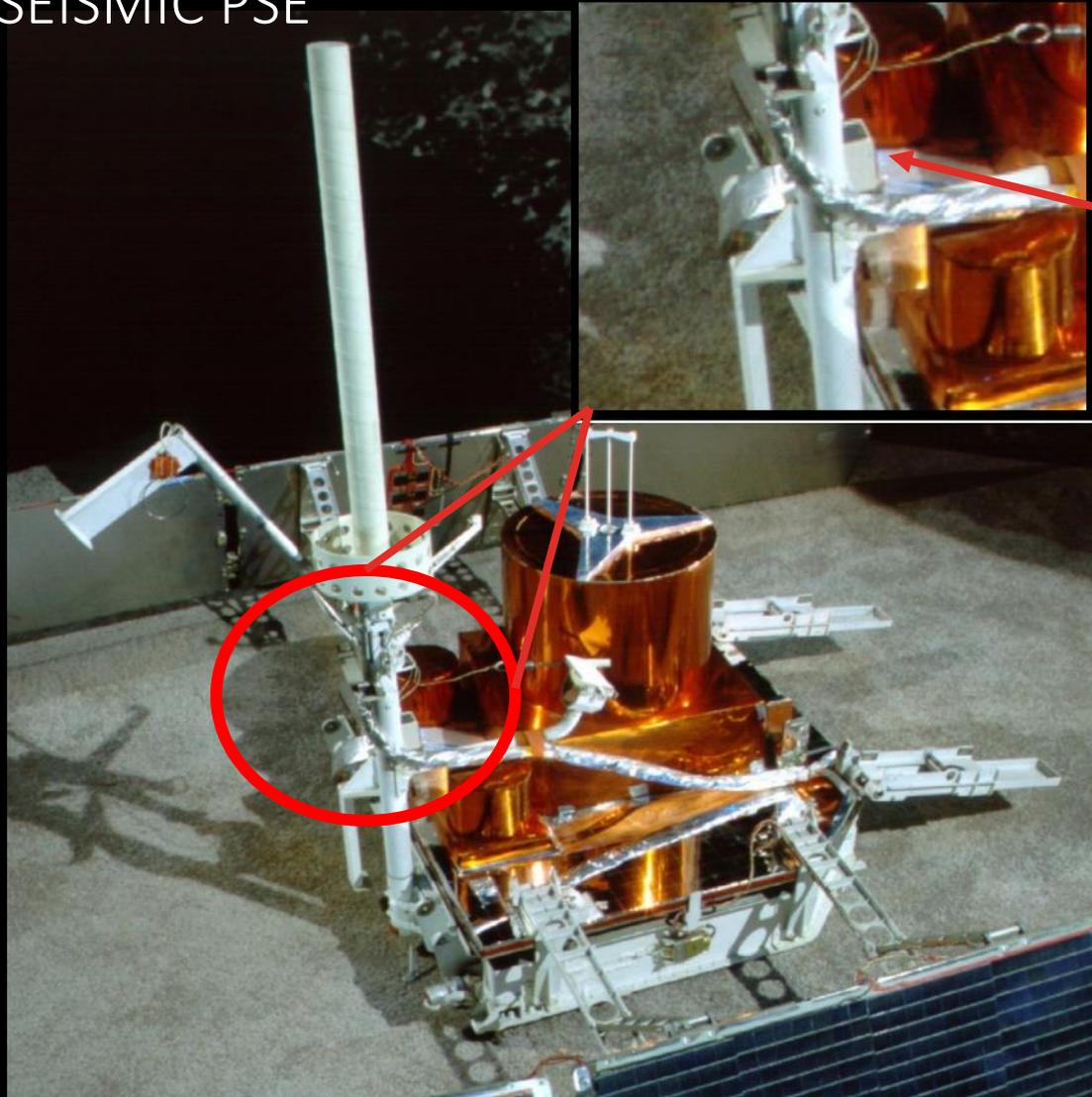


BUZZ DEPLOYS EASEP

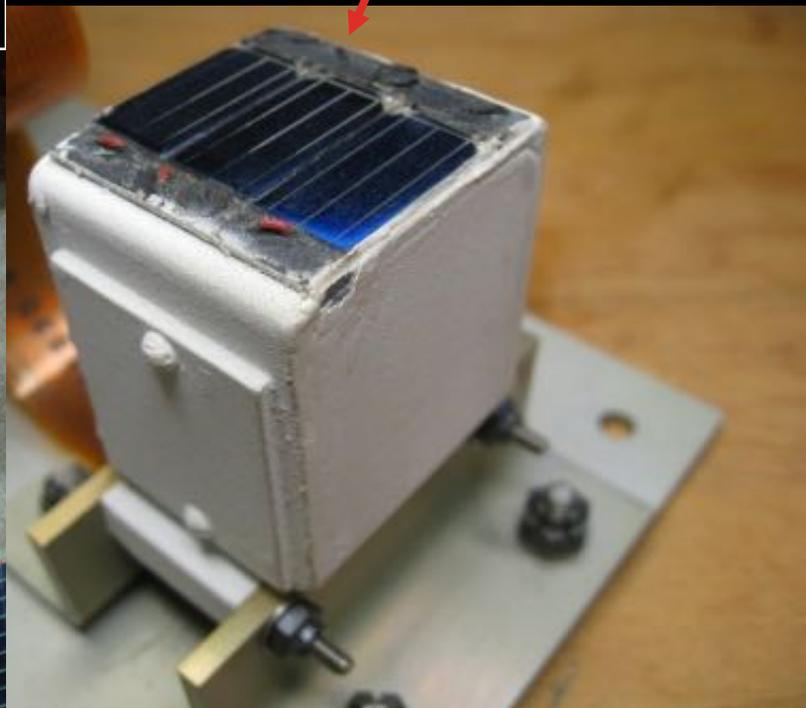


TWO ACTIVE EXPERIMENTS

SEISMIC PSE



DUST DDE



BUZZ – THE FLAG & THE PUBLIC

Buzz Aldrin

“Out of the 6 flags on the moon, ours is the best looking. Until we lifted off and it blew over. And I suspect, unless you place the flag quite a ways away, they probably blew over also. (other missions)

Reporter: “Did Neal see that out the window?”

“Yeah – he saw it, I did not. He shared it with me and we decided it was not important to inform the public immediately”



GENERAL DESIRE NOT TO RAIN ON APOLLO 11 PARADE

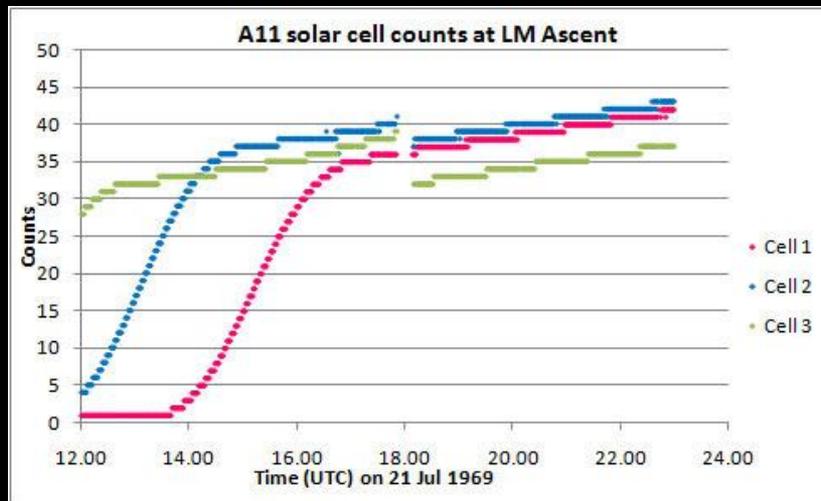
- RELUCTANCE TO ADMIT DUST DAMAGED EASEP
- NEIL & BUZZ KEPT SECRET ABOUT FLAG
- BRIAN ASKED MESSEL NOT TO HOLD PRESS CONFERENCE
- NASA SP-214 STARTED MEASUREMENTS AFTER LM ASCENT
- PRELIM MISSION REPORT 2 OUT OF 3 = 0

SCIENTIFIC ENDEAVOUR NEVER ENDS WITH AN ANSWER - IT SIMPLY OPENS NEW AVENUES FOR TRUTH

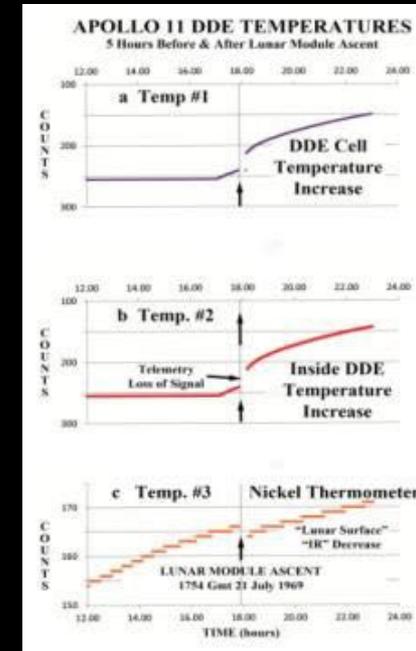
- Don't want to rain on parade but urgently need truth e.g. to deploy Apollo 12 in November & to optimise PSE.
- The truth about dust was not to be found in Apollo 11 Preliminary Science Report SP-214 either on page 100 or in Chapter 10.
- This was additionally important for some 142 PI's waiting for geological samples. Most were collected from areas between LM and EASEP.
- A question was had they been mechanically or chemically disturbed before the samples were taken?

EFFECTS OF LM ASCENT DDE DATA: 6 CHANNELS

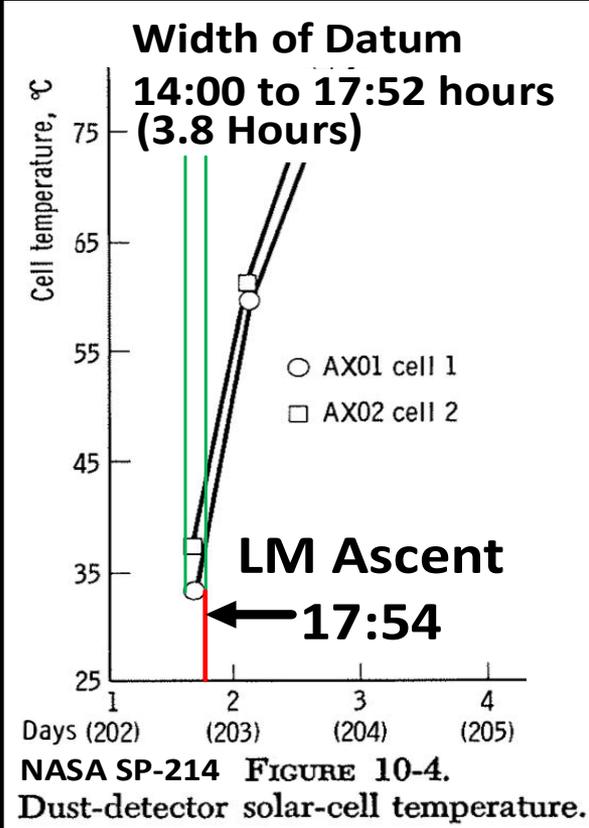
3 SOLAR CELLS



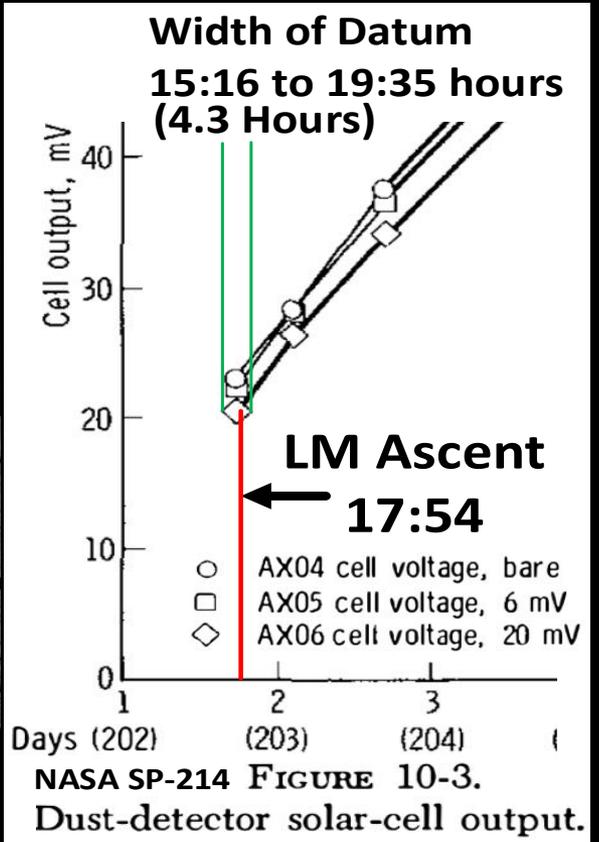
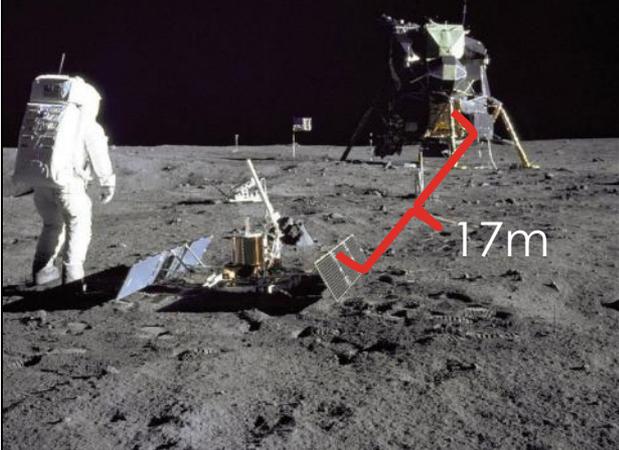
3 THERMOMETERS



EFFECTS OF LM ASCENT



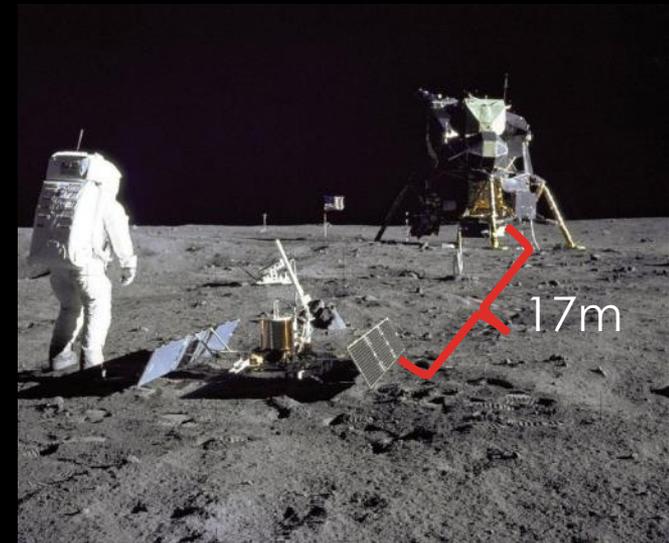
DETAIL OF LM ASCENT IN NASA SP-214



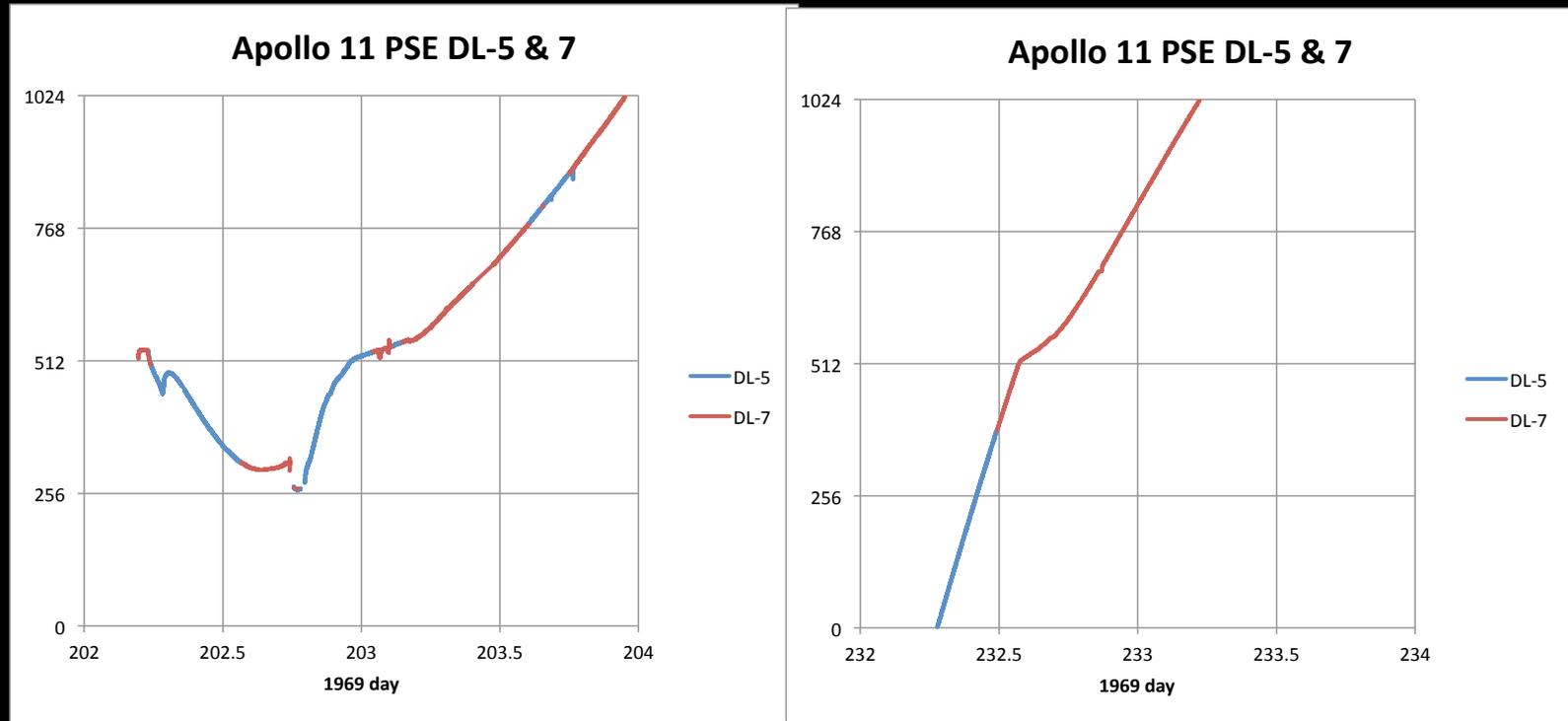
- Debris
- Dust
- ~17m

MAIN RESULTS OF APOLLO 11 DDE

- O'Brien et al., 1970 corrected SP-214 errors;
- Measured degradation of Apollo 11 EASEP during LM ascent when deployment 17 meters;
- Measured effects of first rocket ascent from moon;
- Consequently Apollo 12 was deployed 130 meters;
- In 2019, while working on this presentation, it was proven that contamination of Apollo 11 PSE at LM ascent appears to have two different causes, dust and debris.



TEMPERATURE CHANGES RECORDED ON PSE INSTRUMENT



- Temperature was recorded on two measurement channels, DL-5 and DL-7, because of the data recording irregularity.
- The range of 0 to 1024 in digital count corresponds to a temperature range of 107-143°F, or 42-62°C.
- Note the temperature drop at LM liftoff and the change of temperature increase rate on lunar days 1 and 2.

Main results of Apollo 11 PSE

- Numerous events of different appearances, none similar to seismic signals here on Earth, were recorded.
- With the data from a single station, we were unable to determine what they were.
- With additional stations at the Apollo 12, 14, 15 and 16 landing sites, we were able to determine that what we recorded at the Apollo 11 site included seismic signals from several meteoroid impacts and deep moonquakes.

Future plans

- Many unanswered questions remain, e.g.: (a) Is there any clear dichotomy between the near and the far sides of the Moon in terms of internal structure and seismicity? (b) What really is causing the shallow moonquakes?
- Plans are being discussed among the new generation of scientists how best to conduct the next seismic experiments on the Moon.

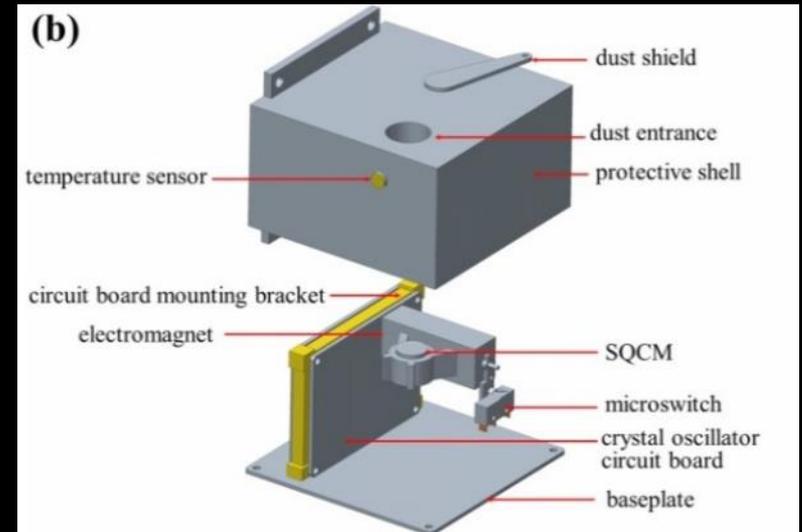
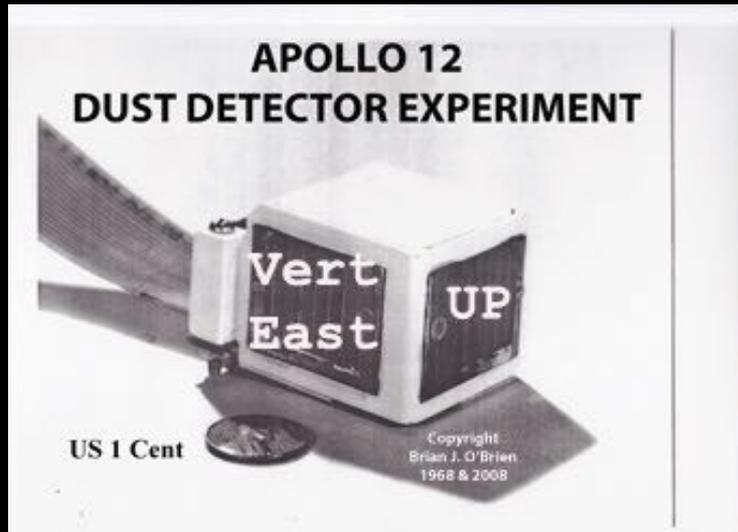
FUTURE LUNAR EXPEDITIONS: COMPLEMENTARY DUST DETECTORS



APOLLO 12 DDE



CHANG'E-3 SQCM





REFERENCES

See Brian's list "References for O'Brien et al., 6th ESF"