



AS 2013.36 - 14/02/2013

Examination of CRV « Cliffbot » Sciencecam videos from tests 97 to 100

The main characteristics of these tests are the following:

Test n°	Date	Localisation	Vertical Height m	Rope length m	Comments (spacesuit ops or not, difficulties, duration)	Data acquired (sciencecam, hazcam visual/photos/recording, outside photos or videos)
97	6/2/13	Above WP 1 at the crest top; 31N22.532 and 4W3.348	8	10	Operations by G. Groemer in Aouda S including all preparatory operations (anti roll rods and equipments on); 8 m vertical; overhang; the vehicle comes back rotated 180°; momentary blockage of the rope in a cliff crack; freed by pulling harder; pole to hold the receiver away from the cliff would be interesting	Hazcam and sciencecam operational; hazcam picture on the monitor
98	“	East of preceding point; 31N22.535 and 4W3.330	20	36 (max rope)	Operations by G. Groemer in Aouda S; 5m vertical then 35° debris slope	“
99	“	East of preceding point; 31N22.532 and 4W3.337	20	36	Operations by G. Groemer in Aouda S; same profile	“
100	“	Very close to first point; 31N22.532 and 4W3.348	20	36	Operations by G. Groemer in Aouda S; same profile; the vehicle rotates 180° in the overhang and roll on the debris slope with hazcam looking in front; comes back still rotated 180°; rear mirror lost	Sciencecam videos from tests 92 to 100 provided to the TV teams; also loaded in the base camp computers.

The pictures from the video were selected with the following criteria:

- indications of fossils
- intriguing rocks (shape, color)
- general views of the cliff or landscape
- views showing the operator and people around

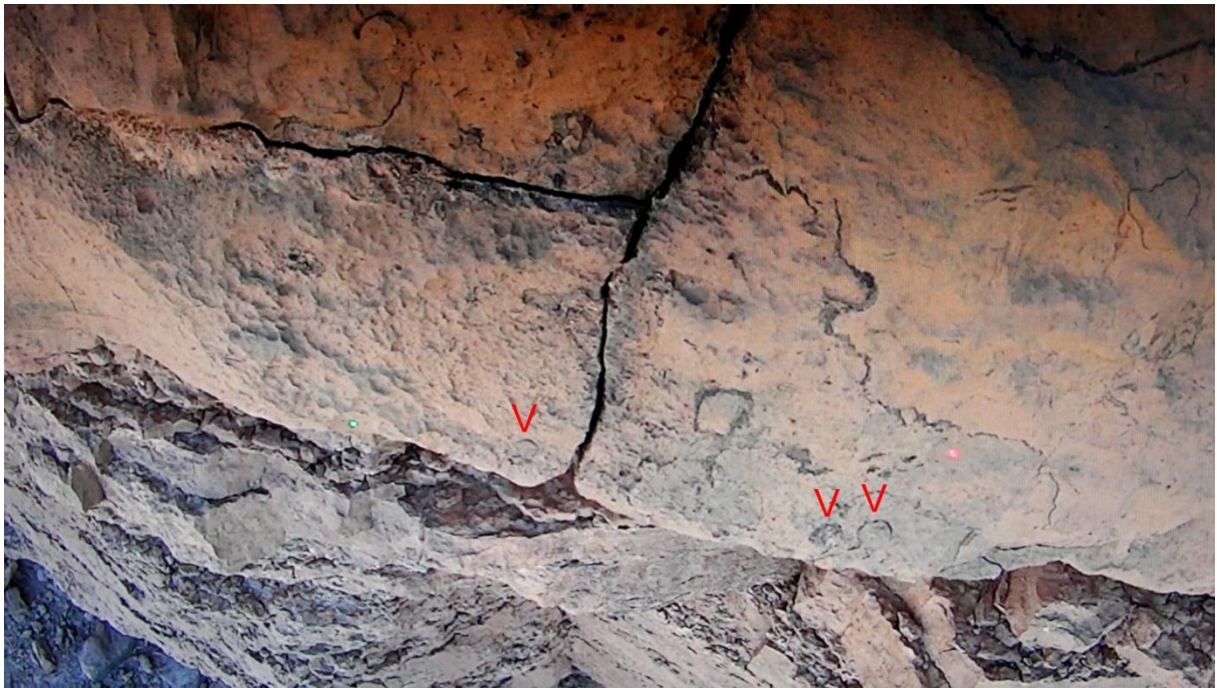
CRV test 97



Time 0.00: start of the Sciencecam video



Time 0.25: start of operations



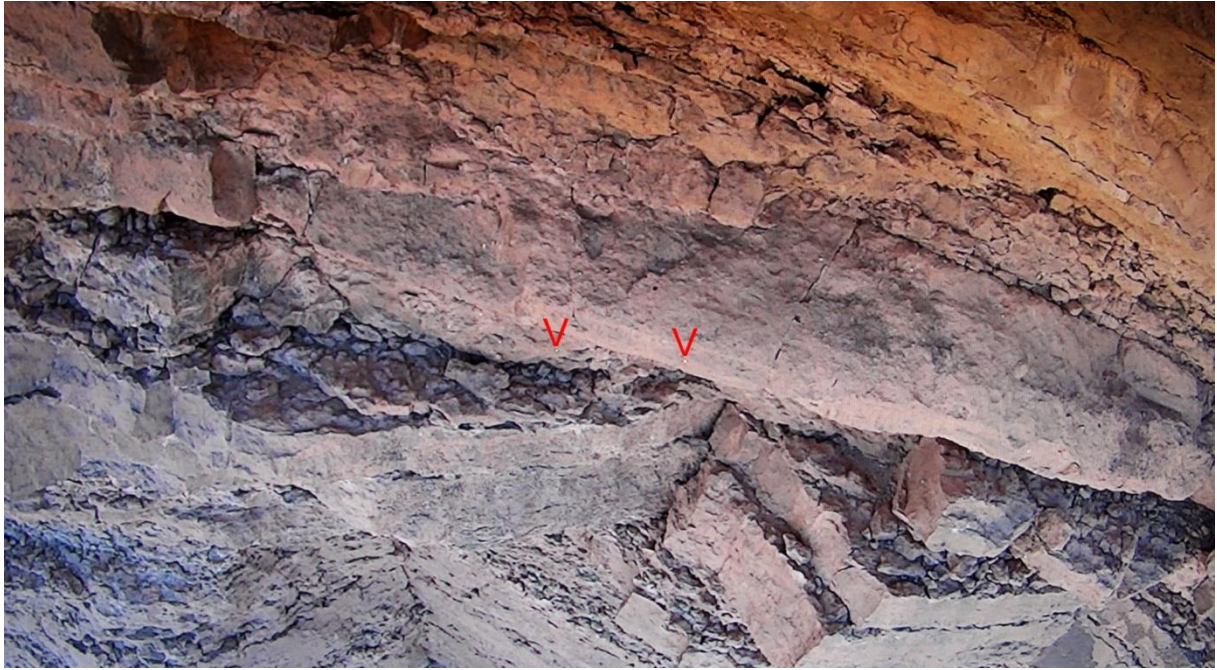
Time 3.16: possible indication of fossils (circular shapes); the two laser spots, green on the left and red on the right are visible. Their distance is 22,5 cm thus the circular shapes are 1.2 cm in diameter.



Time 3.17: same area; the green laser is no more visible, being hidden under the overhang.



Time 3.18: circular shapes seen closer



Time 3.23: the two lasers spots are visible and seem close to each other; it means the vehicle is far from the wall under an overhang. Calculation gives around 70 cm for the overhang knowing that the field of view is 120° .



Time 3.29: rotation of the vehicle to the right showing the side of the cliff. The cliff seems to be an alternation of hard limestone and softer layers of clays mixed with small rocks.



Time 4.20: side view



Time 6.05: “the cliffbot has landed”. The two laser spots are visible. The video shows that the vehicle has rotated by $2 \times 360^\circ + 180^\circ$ on the right before reaching the ground. This indicates an overhang of more than 1.3 m otherwise the antiroll rods would have stopped the rotation. The Sciencecam is now facing down slope instead of facing up slope.



Time 6.32: possible fossils on the left



Time 6.33: possible fossils on the right



Time 6.40: same possible fossils on the left as in picture time 6.32. Possible fossils on the right, the lower one presenting a spherical shape.



Time 9.33: same area as the preceding picture



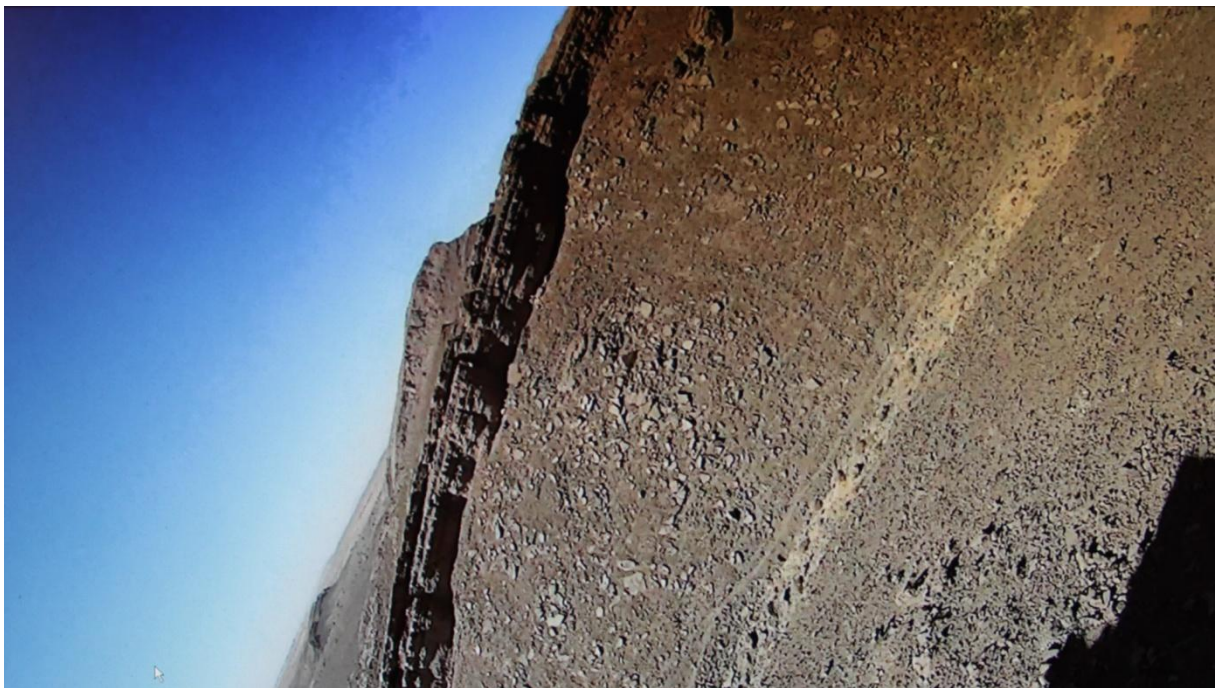
Time 14.21a: the vehicle is being retrieved up the cliff



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Time 14.39: view opposite to the cliff showing one of the mud volcanoes. The vehicle is canted 60° to the right indicating a difficulty for one wheel to get up the overhang.



Time 14.46 : vehicle still strongly inclined (70°)

CRV test 98



Time 1.14: indication of fossil (circular shape); the green laser is not operating on this run.



Time 2.47: strange area of blue rocks! This area is at the bottom of the cliff.



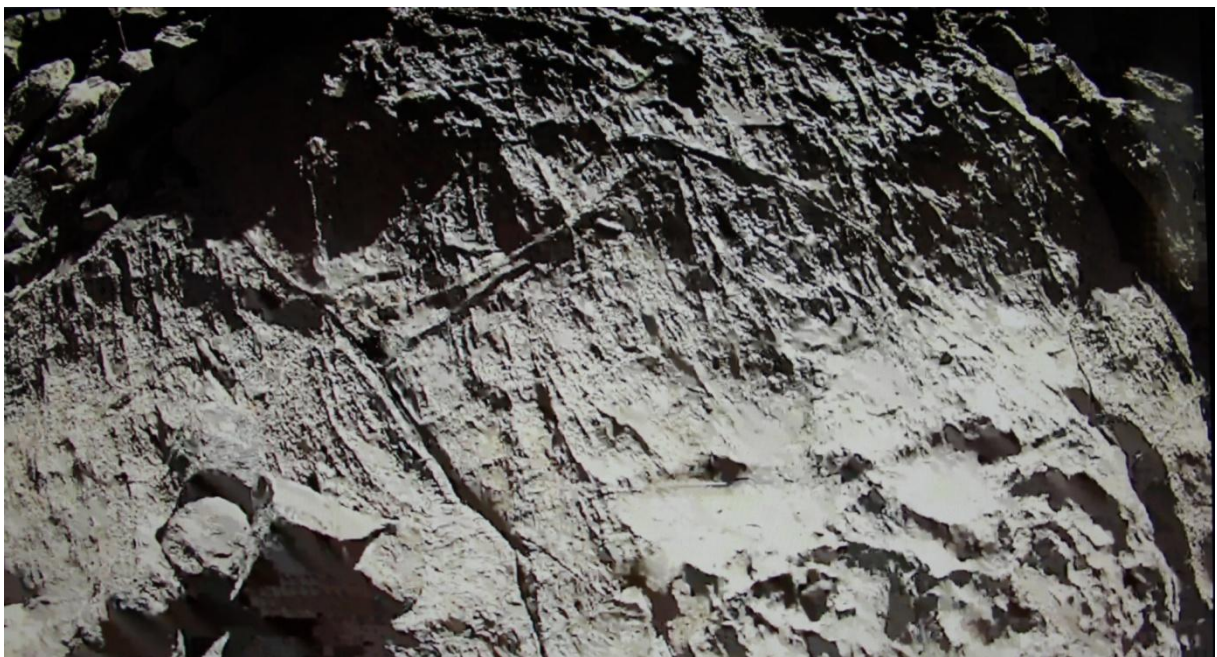
Time 2.48: indication of fossil in the upper right corner in the area of blue rocks.



Time 2.56 : transiton from blue to grey rocks



Time 5.01: cylindrical rock on the left (fossil ?); many rocks with this shape were found in the base camp area.



Time 5.11: striated rock



Time 5.43: probable fossil in the upper left corner



Time 7.02: probable fossil on the left



Time 7.34: back to the bottom of the cliff; possible fossil on the right.



Time 7.35: back in the blue zone; the rock in the middle seems to have only one face blue.



Time 7.54: still in the blue zone.



Time 7.56: well identified fossil on the left



Time 7.56: zoom on the fossil.



Time 7.58: same fossil



Time 8.04: the blue area at the bottom of the cliff.



Time 8.19: the blue area at the bottom of the cliff.



Time 8.20: the blue area seen from a farther location above the overhang.

CRV test 99



Time 0.06: preparation for the test; the mud volcanoes are visible on the right.



Time 0.20: preparation for the test; the base camp is visible on the far left.



Time 0.23: indications of fossils very close to the cliff top.



Time 2.48: possible fossil.



Time 2.50: again a cylindrical stone; fossil or other natural type of stone?



Time 2.50b: in a strong rocking motion of the platform the camera sees the rope and the operator up the cliff.



Time 2.51: in this strong rocking motion the camera sees also the mud volcanoes on the other side.



Time 2.52: back to the cliff and operator side.



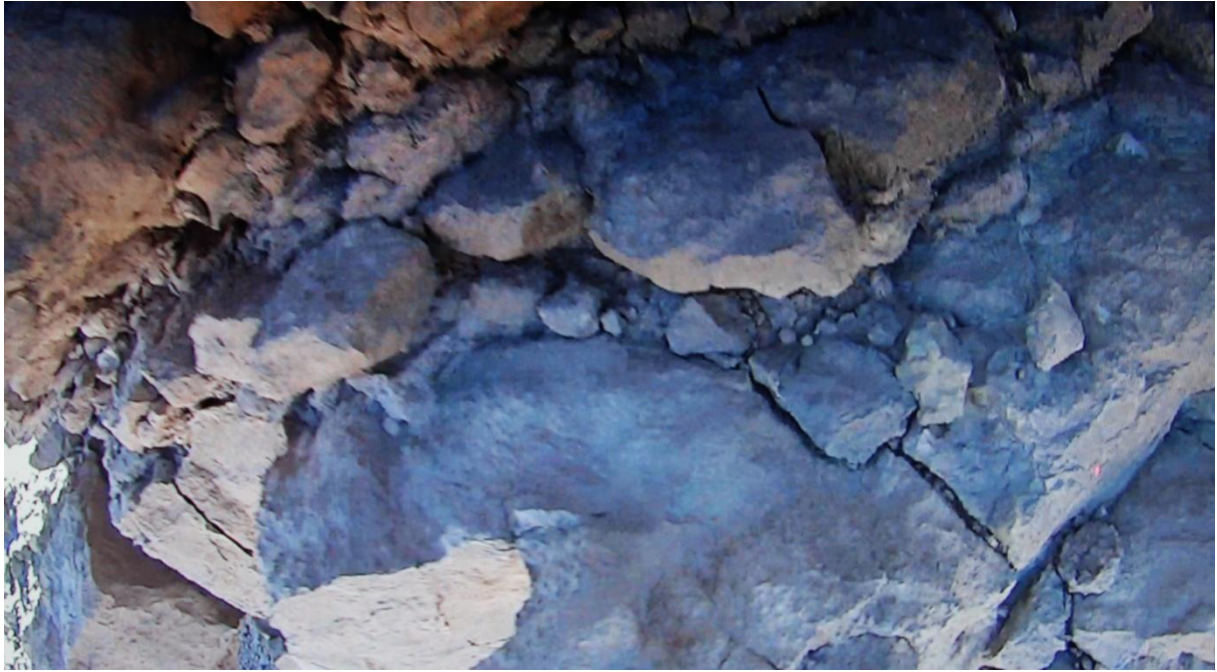
Time 2.56: fossil on the upper right.



Time 8.53: the green laser is now operating during some seconds.



Time 8.57: possible fossil.



Time 9.27: the cliffbot is brought back up the hill and crosses an area of blue rocks which, in this part of the cliff, seems now at mid level and not down the hill like seen in the preceding test. This blue area is barely visible on the way down.

CRV test 100



Time 0.36: grey blue area.



Time 1.44: the vehicle is rotated 180 ° with the Sciencecam looking down the hill; possible fossil in the middle right. The stone in the forefront middle seems also to present indications of fossils.



Time 1.48: same area.



Time 2.01: possible fossil (circular shape) in the forefront.



Time 2.24: possible fossil



Time 3.49: landscape view with the mud volcanoes when the vehicle is brought back the hill.