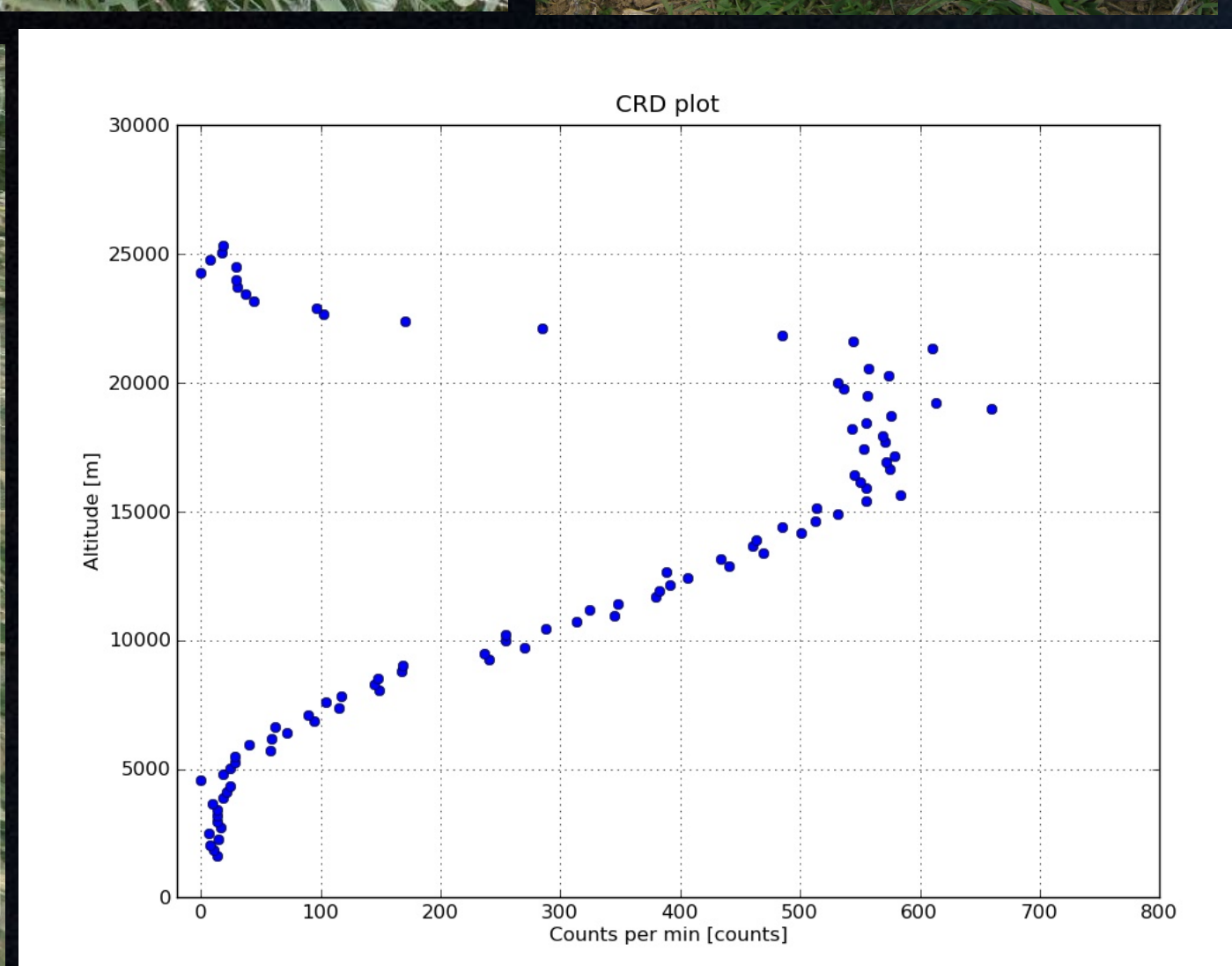




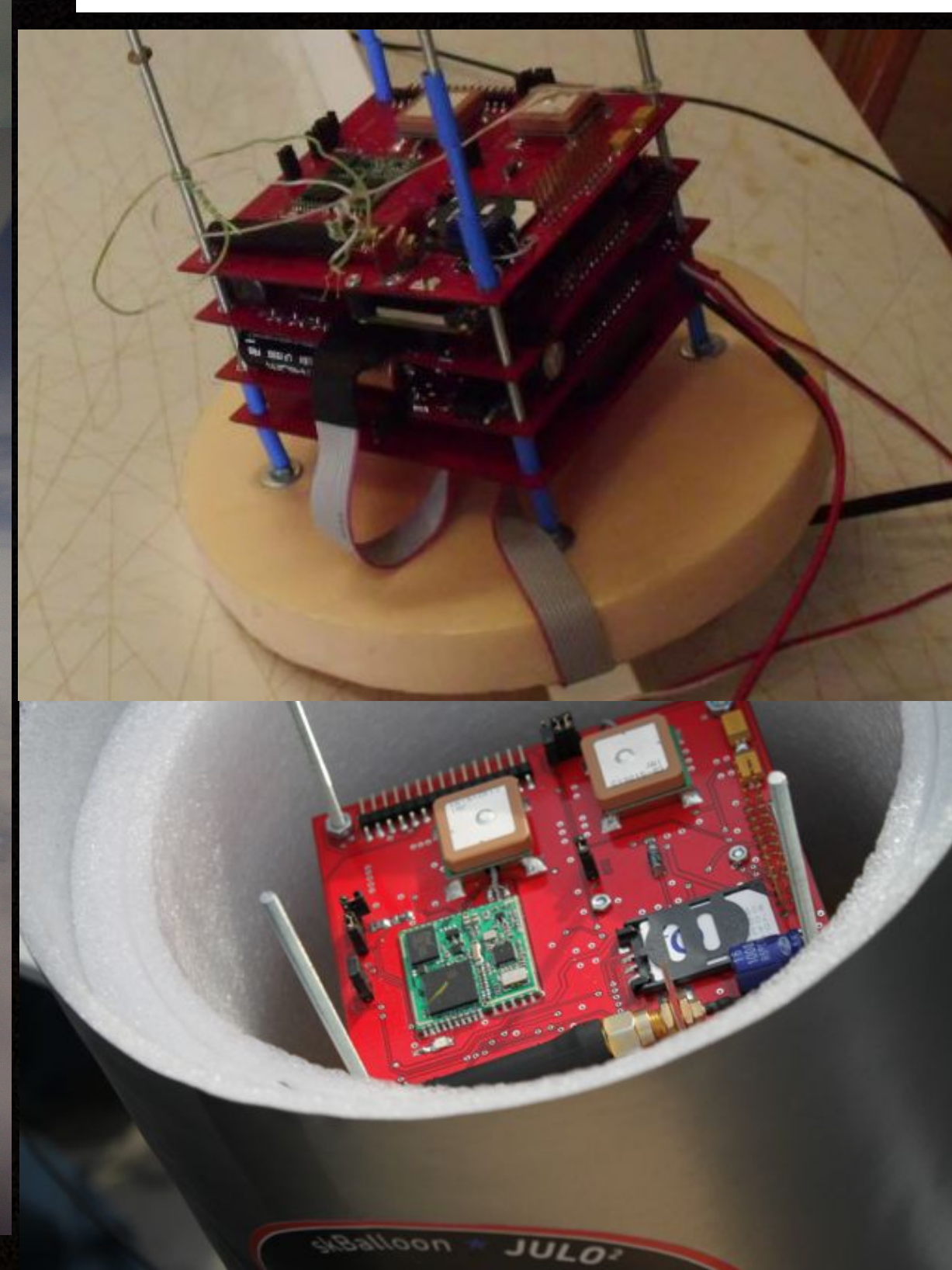
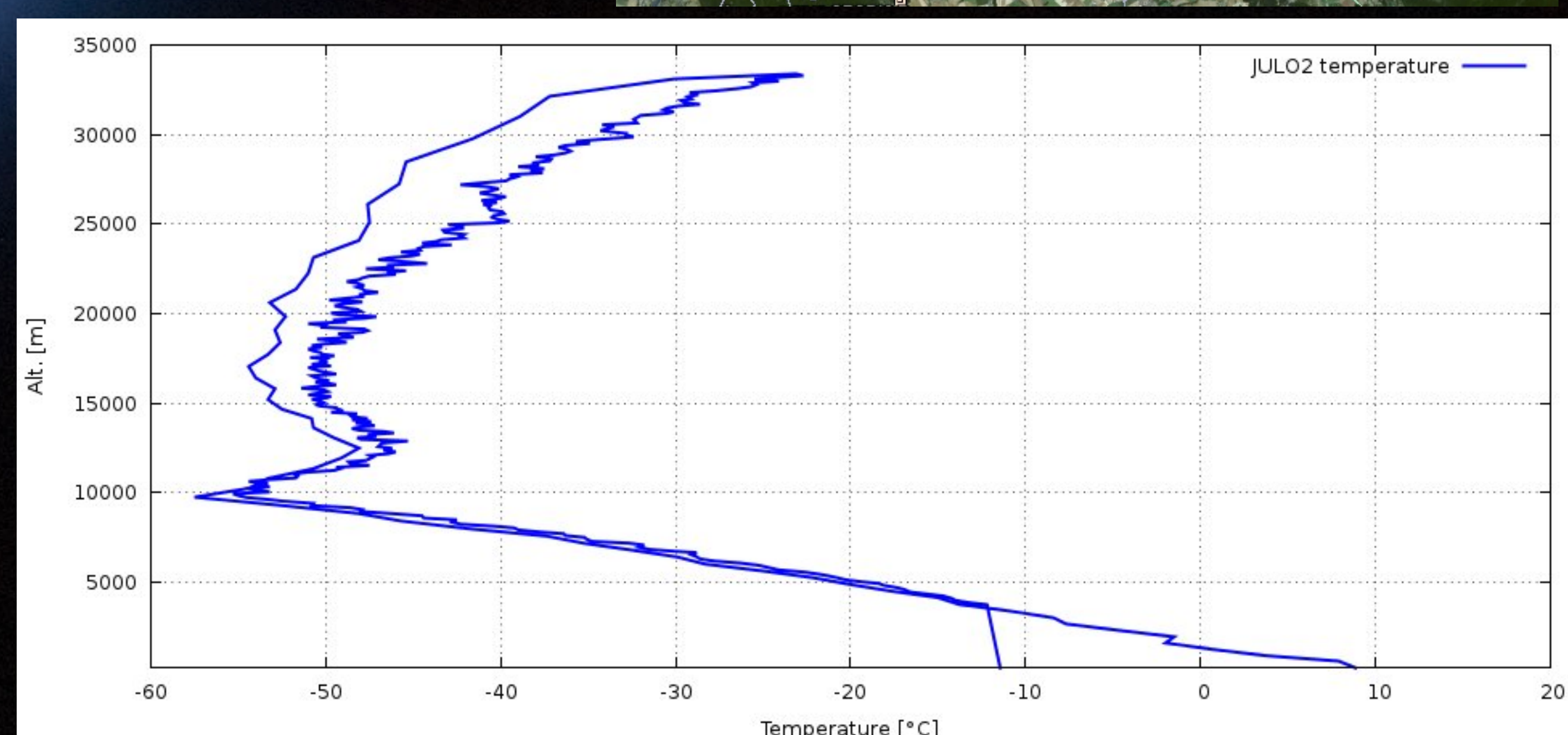
Near-space experiments in Slovakia

JULO1 & JULO2



JULO2

JULO2 was launched in the windy and cloudy weather on 14th of April 2012. JULO2 carried two small HD cameras, one was attached to the parachute and the other one was placed on the sensors arm. GOPRO camera which took a picture once every 2 minutes from the bottom side of gondola was also pointed down. JULO2 carried several thermometers for internal and external measurements, pressure meter, two GPS and one GSM module and one Geiger-Miller tube. Unfortunately the GM tube stopped working at 20km. The flight of JULO2 lasted 2 hours and 24 minutes and it reached the height of 33 394m above sea level. We also used JULO2 for unique registration of .sk domains from the near space. This was sponsored by Slovak company Web-support. The SOSA team is now focused on the cube sat project called skCube where we want to use the experience gained from JULO missions. We are also planning a new JULO mission, which will be a very small gondola with the same design as JULO2 but it will carry only one camera, thermometer and GPS. The goal will be to reach altitude of 40km over Slovak landscape. We are very happy that our JULO experiments are getting attention of the public and press. It is the best way how to arouse interest in study of space and physics in the public.



JULO2 pictures: top right image shows the JULO2 path through Slovak and Czech landscape. The four pictures on the right show a sequence from a small HD camera attached on the parachute and the picture below them is the balloon burst how it was recorded by the on-board accelerometers. There are images from GOPRO camera on the left. Pictures of internal JULO2 design are in the middle, you can see similarities to the CubeSat internal design. There is a temperature graph on the top as well. The more spiky and rugged curve corresponds to the balloon ascend.

JULO is the name of amateur near space balloon experiments managed by Slovak Organization for Space Activities (SOSA). We have been able to launch two successful balloon experiments so far. We have been able to launch two successful balloon experiments so far: JULO1 balloon on the 10th of October 2010 and JULO2 on the 14th of April 2012. The whole idea of JULOs missions is to create a cheap and easy to use platform for the near-space experiments. Such platform can provide an opportunity for students and space research enthusiasts to bring their experiments to the near-space environment. One of the main goal of JULO program is also to get know-how and create a community for building the first Slovak CubeSat. The JULO program is named after a famous Slovak actor and entertainer Julius Satinsky.

JULO 1

The construction of JULO1 was based on MikroTik Routerboard 411U with Openwrt Linux ver.:10.03. The gondola was made of polystyrene with payload weight 1.3kg.

Communication: UHF transmitter at 446.09375MHz FM (channel PMR 8). We used SENCOR SMR500.

Sensors: in/out temperature, atmospheric pressure, battery voltage, web camera, three axis accelerometers, GPS, two GeigerMuller tubes and detector of crashed balloon. Unfortunately the camera did not worked properly so there are no pictures from first JULO mission. Other detectors worked nominally, except for GPS malfunction at 23 km. The GPS fix was established again after balloon descended to ~6km altitude. JULO1 reached altitude about 24 000 m above sea level. Lessons learned from JULO1 were: we need less complicated design and use cameras which can independently store pictures or videos on their own memory cards. We also decided that our next mission JULO3 should look more professional and more similar to cube sats.

Pictures (top) from left to right: Launch of JULO1 in Partizanske Observatory and launch of JULO2 at the same place but with more attention of the press. Two pictures of landings sites follow. There are JULO1 with its triangular shape and JULO2 with circular shape and GOPRO camera. The bottom left image shows the path of JULO1 in the atmosphere and the bottom right image shows the cosmic ray detector1 counts per minute. You can see how the radiation increase with altitude up to ~18km.

