

**The problem**

Our government has tracked a possible alien spacecraft which they believe could have been probing the Earth with microwave radiation.

Special agents from “the government” show up at your door and ask for your help, as a radar expert, to help assess the aliens’ technology and try to figure out what they are up to.

**What is known**

The alien craft was tracked by ground-based systems so a few operating parameters are known. The ship was in orbit when it was tracked – the orbit was nearly circular. Several pieces of the transmissions probing the Earth were recorded, permitting the wavelength to be measured, as well as several other parameters.

Also, two data files were intercepted. One is now posted on the class web site under the Homework 6 entry on the homework page (file name data.hw6).

Here is a summary of the known parameters:

Altitude in orbit:	696000 m
Wavelength:	0.236057 m
PRF:	2159.827 Hz
Sample rate fs:	16.0 Mhz
Chirp slope:	approx. $-5 \times 10^{11}$ Hz/s (note minus sign)

**Your job**

Look at the file called data.hw6 and process it into an image. Find all approximate or unknown parameters from the data. Use a focused SAR algorithm, but you can neglect range migration. (If you want a few extra points, try range migrating the data.)

You will have to determine data recording formats.

Be ready to report your results to the class by Feb. 17.