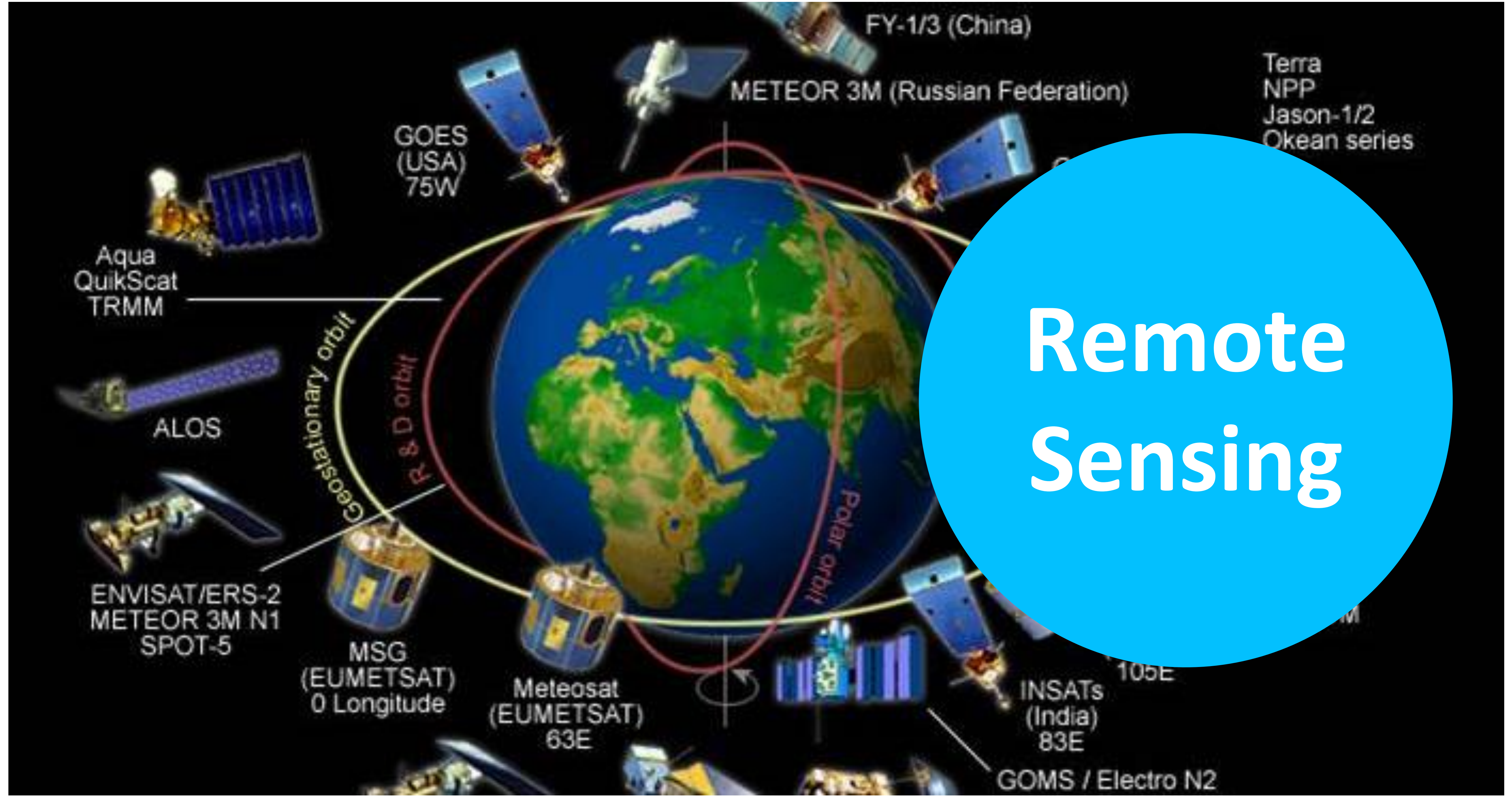


Remote Sensing



Remote Sensing

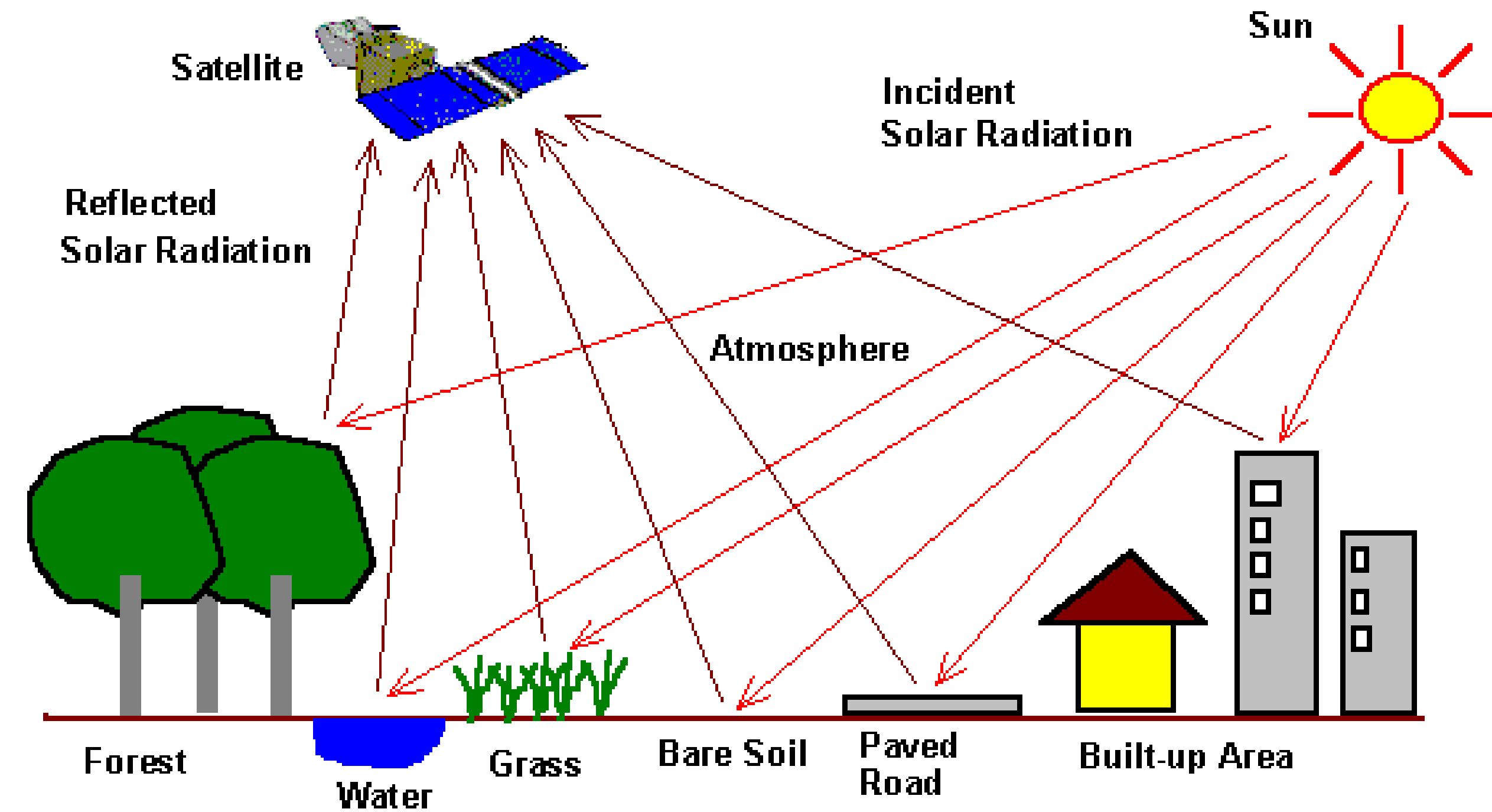
Remote sensing is defined as a technique for getting information about objects by analysing data collected by instruments that were not in direct contact with the objects.

Remote sensing systems are composed of:

- 1- Radiation (energy) source,
- 2- Sensor,
- 3- ground surface materials.

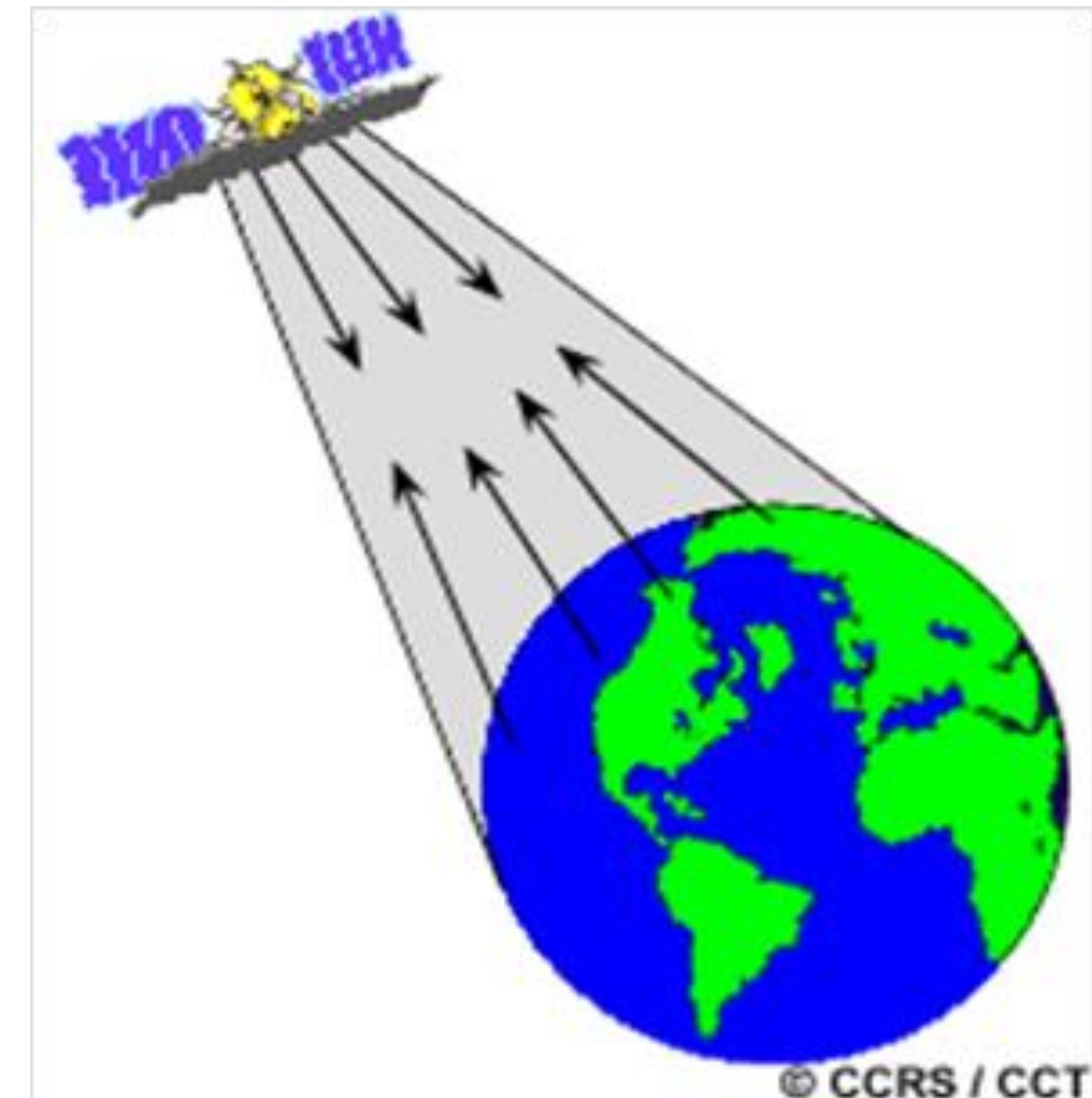
Passive System

- It uses an external source of energy, the sun.
- Upon striking the land and ocean surface, the incoming radiation (irradiance) partitions into three modes of energy-interaction response:
 - 1- absorption,
 - 2- transmittance
 - 3- reflectance.
- The reflected part is sensed by the sensor and is transferred to image data.



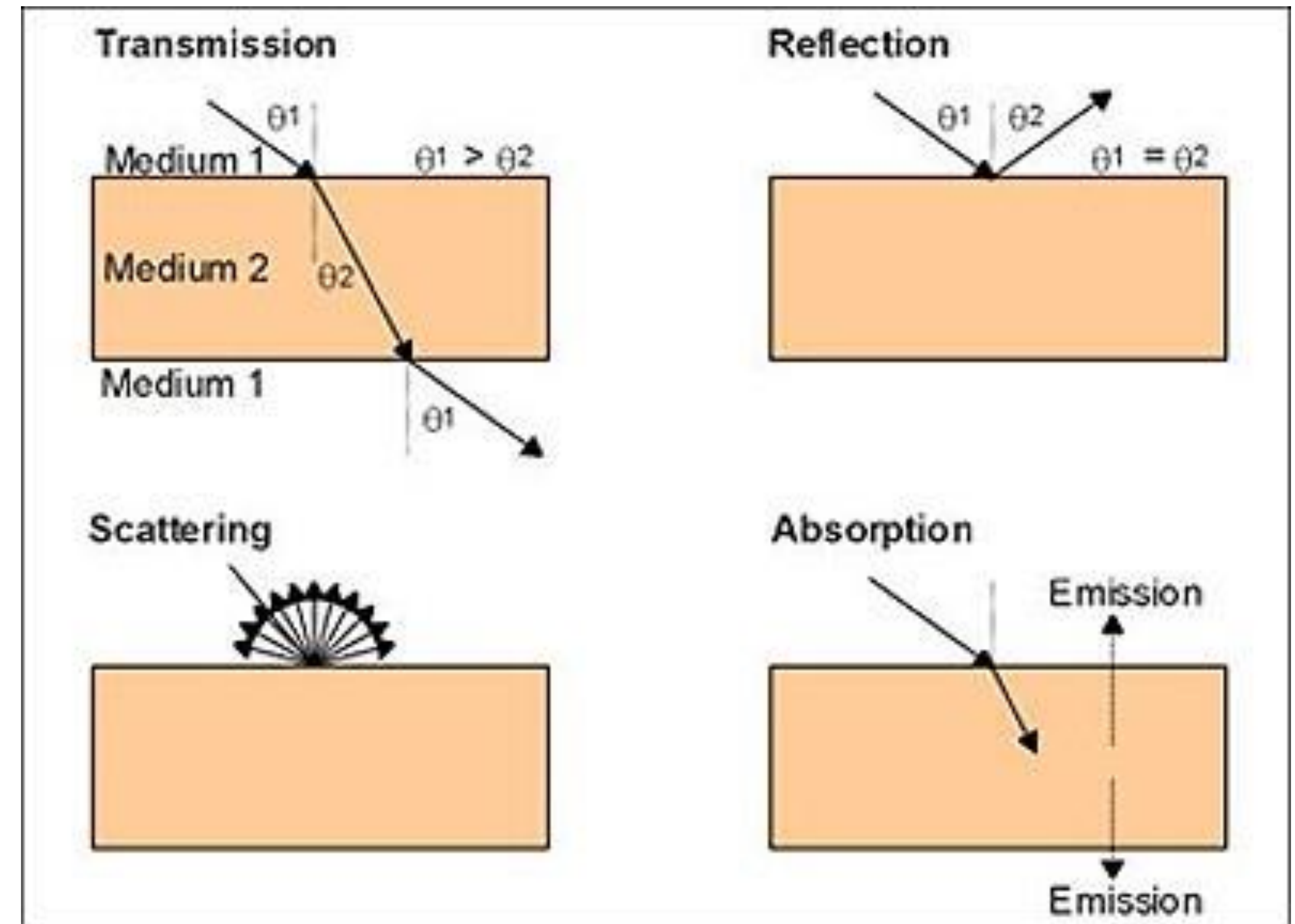
Active System

- In this one the system sends its own energy to the target, receives the reflected energy and senses it.
An example is the RADAR.



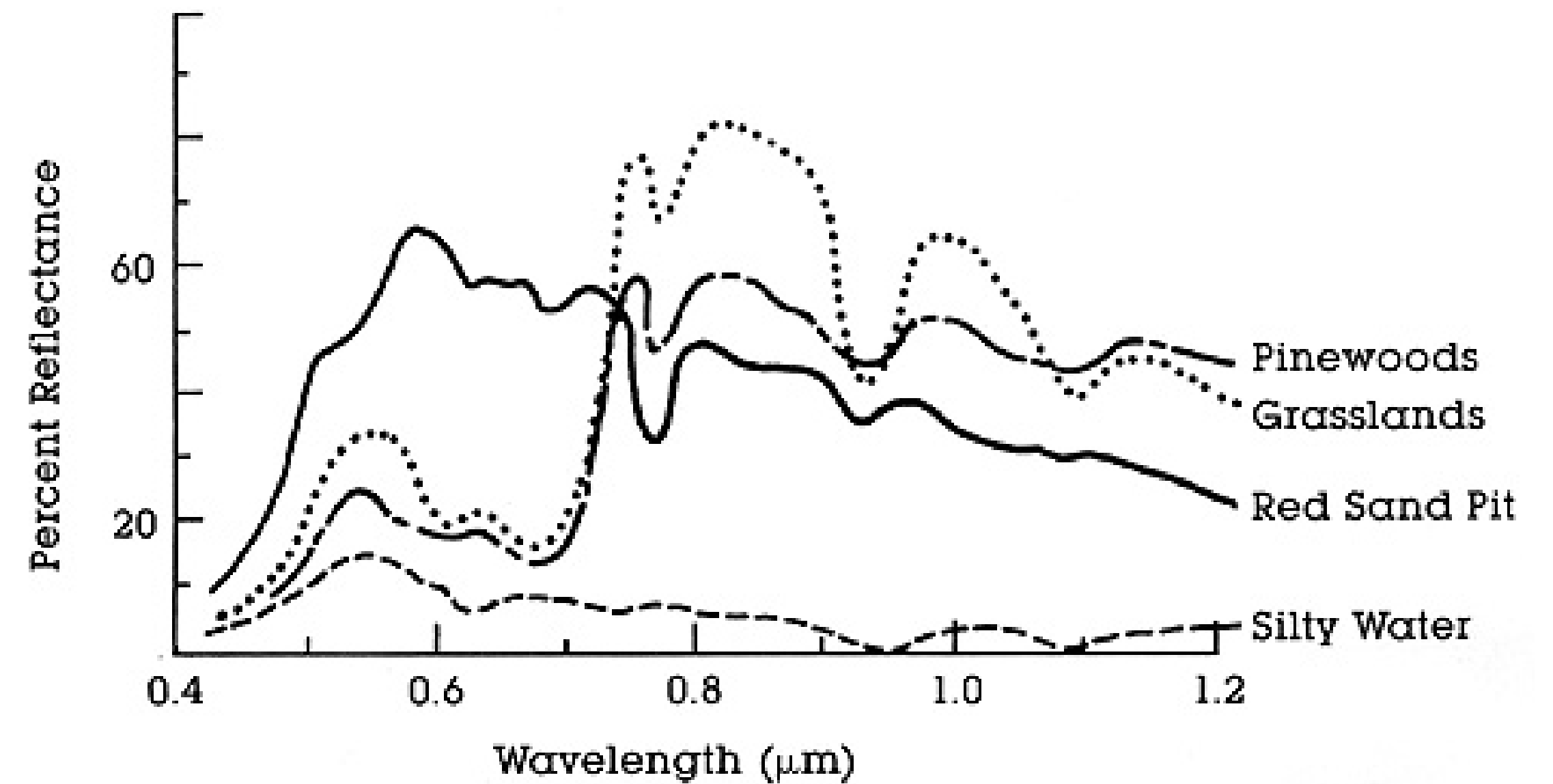
Electromagnetic Radiation Reaction

- Most remote sensing systems are designed to collect reflected radiation.



Spectral Signatures

- For any given material, the amount of solar radiation that it reflects, absorbs, transmits, or emits varies with wavelength. When that amount coming from the material is plotted over a range of wavelengths, it produce a curve called the material's spectral signature (spectral response curve).



Digital Image

- In a black-and-white digital image each pixel has, for example, a conventional value of from 1 to 10. The data may be represented as a grid of values, but if we decide to assign an intensity of grey to the numerical values (1 = black, 10 = white), the grid of numbers turns into a picture.

8	9	0	9	0	9	0	0	9	0	0	9	9
6	9	9	5	5	5	5	5	5	0	9	9	9
9	9	9	6	5	5	5	5	5	5	8	9	9
0	0	0	0	5	5	5	5	5	5	0	0	0
8	9	9	8	5	5	5	5	5	5	9	9	9
8	9	5	5	5	5	5	5	5	5	5	5	9
0	9	9	7	7	7	7	7	7	7	9	9	9
9	9	9	8	7	7	7	7	7	7	8	9	9
9	9	9	9	7	1	7	7	1	7	9	9	9
0	9	9	9	7	7	7	7	7	7	9	9	9
0	9	0	0	9	7	7	7	7	9	0	9	9
0	9	9	5	9	7	3	3	7	9	9	9	9
9	9	9	8	9	7	7	7	7	9	8	9	9
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0	0	0	0	0	9	0	0	0	0	0	0	9

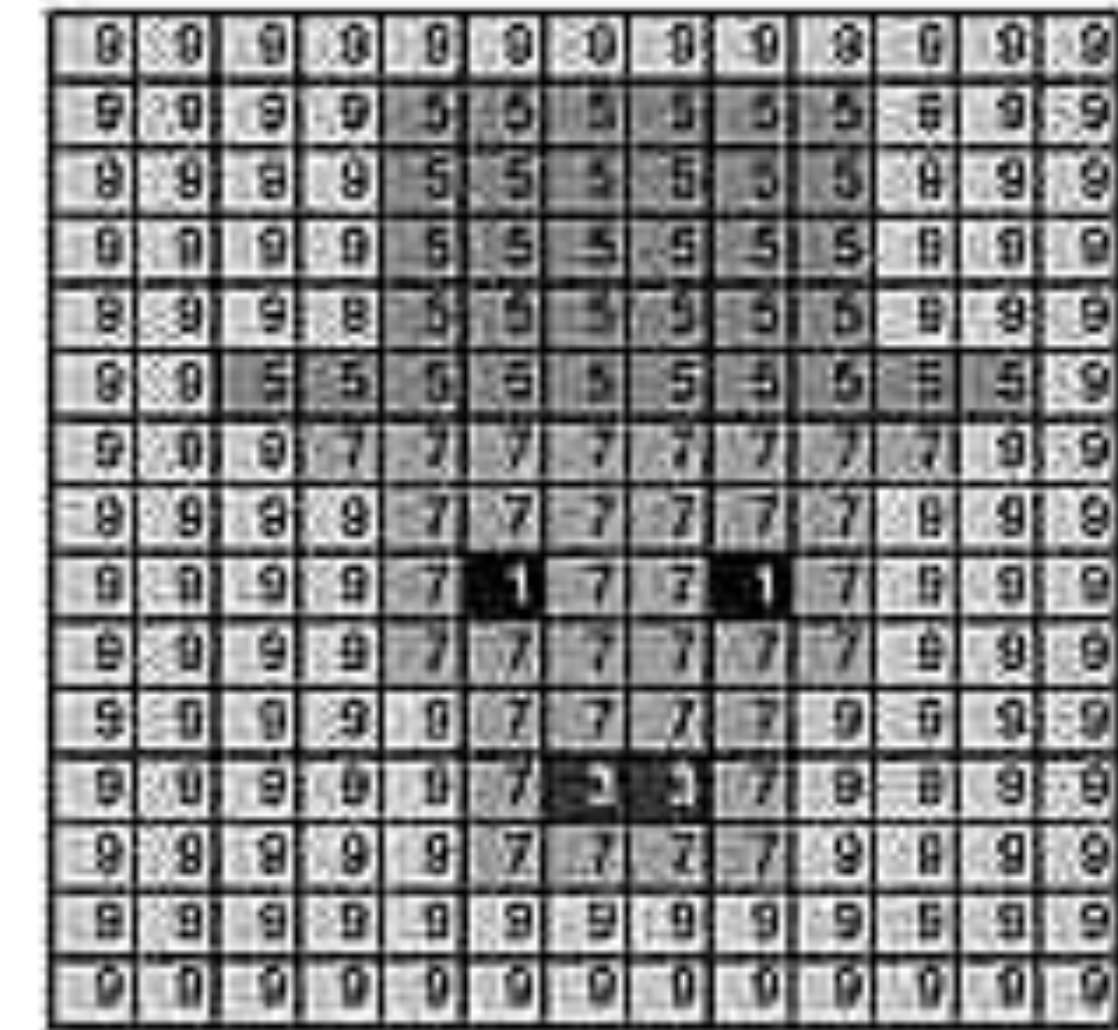
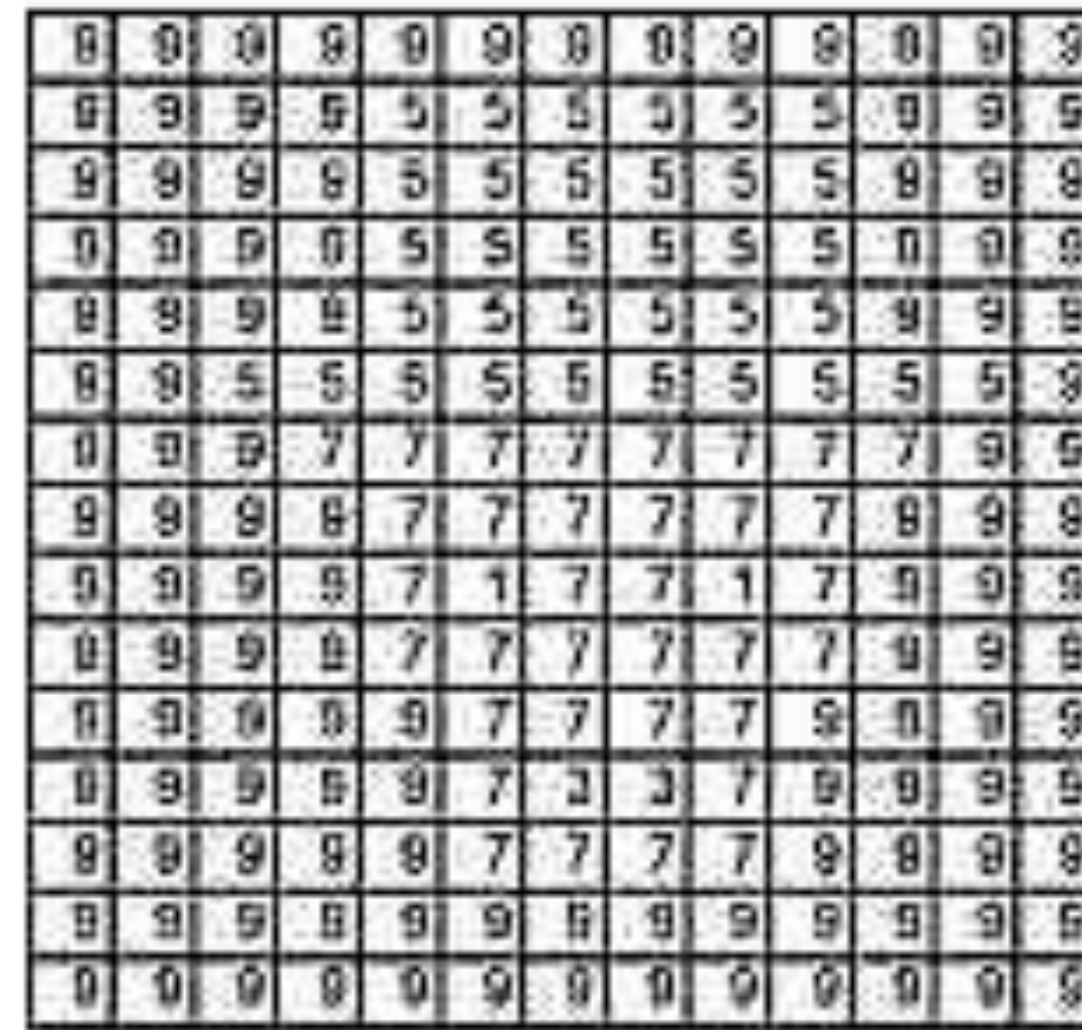
0	0	0	0	0	0	0	0	0	0	0	0	0
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9	9	8	9	5	5	5	5	5	5	8	9	9
0	0	0	0	5	5	5	5	5	5	0	0	0
9	9	9	8	5	5	5	5	5	5	9	9	9
9	0	5	5	5	5	5	5	5	5	5	5	9
9	0	0	7	7	7	7	7	7	7	7	9	9
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9	0	9	9	9	7	2	2	7	9	9	9	9
9	9	8	9	9	7	7	7	7	9	8	9	9
9	9	9	9	9	9	9	9	9	9	9	9	9
0	0	0	0	0	9	0	0	0	0	0	0	9

Legende:



Digital Image

- The task of any remote sensing system is to detect radiation signals, determine their spectral character, derive appropriate signatures, and inter-relate the spatial positions of the classes they represent.
- This ultimately leads to some type of interpretable display product, that mirrors the reality of the surface.



Legende:

