ABSTRACT

Recent innovations in X-ray instrumentation have enabled a new generation of planetary XRS instruments exhibiting performance matching terrestrial laboratory results.

Miniature X-ray Tubes
- Much higher output
- Control of excitation
- Low power (1 watt)
- Rugged

Performance
- ppm detection of trace elements
- Wide element coverage (C to U)
- Adaptable to difficult environments
- Light-element info from scatter
- Reduced mass/power/volume

Silicon Drift Detectors
- High count rates
- Can operate at room temperature (and above)
- Light element sensitivity

Window Materials
- Thinner window materials allow detection of light element X-rays
- Rugged window materials allow operation at high pressures, in corrosive atmospheres, and via direct push in to subsurface regolith

Applications
- Penetrators
- Touch-and-go probes
- Astronauts
- Process control
- In situ/boreholes
- Analytical laboratories

Digital Pulse Processing
- Short shaping times
- Optimal pulse shape
- Excellent pileup rejection
- Reduced mass and power
- Can be integrated with control and comms