The EOL power generated by an array is impacted in a variety of ways. Radiation damage will result in an 8% loss of BOL power/m^2 after 5×10^{14} 1 MeV electrons (i.e. typical EOL fluence in geosynchronous orbit). The temperature correction due to the operation of the solar cell at 75°C rather than at the 25°C test conditions will reduce the power/m^2 by ~9%. Degradation due to UV exposure is around 1.7%. Loss in power over time due to micrometeors and ordinary surface contamination are each around 1% [24].

The solar arrays presently in use can be classified into six categories:

- Body-mounted arrays
- Rigid panel planar arrays
- Flexible panel array
- Flexible roll-out arrays
- Concentrator arrays
- High-temperature/intensity arrays
- Electrostatically clean arrays.

A summary of the important typical characteristics of these arrays are given in Table 10.7.

10.5.1 Body-mounted Arrays

Body-mounted arrays are preferred for small satellites that only need a few hundred watts. Early spherical satellites and spin-stabilized cylindrical satellites used body-mounted arrays of silicon solar cells on the honeycomb panels. This type of array is simple and has proven to be extremely reliable. One of the limitations of this type of array is that it puts a constraint on the direction the spacecraft must point. This type of array is still used on smaller spacecraft and spin-stabilized spacecraft. The recently deployed Mars Pathfinder Sojourner Rover also used body-mounted solar arrays (see Figure 10.10).

10.5.2 Rigid Panel Planar Arrays

Rigid panel arrays have been used on many spacecraft requiring several hundred watts to many tens of kilowatts of power. They consist of rigid honeycomb core panels that

Table 10.7 Space solar array characteristics [16]

Technology	Specific power [W/kg] (BOL) @ cell efficiency	Cost [$K/W]	Area per power [m^2/kW]
High-efficiency silicon (HES) rigid panel	58.5 @ 19%	0.5–1.5	4.45
HES flexible array	114 @ 19%	1.0–2.0	5.12
Triple junction (TJ) GaAs rigid	70 @ 26.8%	0.5–1.5	3.12
TJ GaAs ultraflex	115 @ 26.8%	1.0–2.0	3.62
CIGS thin film[a]	275 @ 11%	0.1–0.3	7.37
Amorphous-Si MJ/thin film[a]	353 @ 14%	0.05–0.3	5.73

[a]Represents projected values. These arrays are unavailable commercially