Major breakthroughs in perovskite solar cells (PSCs) efficiency have been achieved in the past few years resulting in a substantial performance boost. PSCs are well cited for employing earth abundant material through low temperature solution process enabling high efficiency at lower cost. One of their most attractive attributes is successful fabrication of ultrathin highly flexible PSCs yielding a significantly high specific power compared to other PV technologies. This makes PSCs a suitable candidate for the space application where mechanical flexibility and high specific power are considered to be favorable due to limited mass and surface area budgets of spacecraft. However, space has completely different environment than that on Earth, where solar cells are exposed to not only UV photons but also high energy radiation particles (predominantly composed of electrons and protons), the large number of thermal cycles, atomic oxygen etc. leading to performance degradation of solar cells. Hence, if one thinks of space application of PSCs, it is important to investigate their radiation response and evaluate the End of Life (EOL) efficiency for a condition of a given mission. Radiation response of space solar cells is typically obtained by irradiating solar cells with 1 MeV electrons with the fluence of ca. $1 \times 10^{15}$ electrons/cm². Preliminary studies (PSCs on glass) have successfully demonstrated a considerable resistance of important characteristics of PSCs against 1 MeV electrons. In this work, we present efficient ultrathin flexible PSCs fabricated on PET film, characterized by a promisingly high specific power and possible space applications varying from ultra-light weight solar panels for satellites to printed production during the mission. Further, we also report preliminary results of studies performed on radiation tolerance of our flexible PSCs. To the best of our knowledge, this is the first systematic study of radiation tolerance on flexible PSCs.

In this work, we present efficient ultrathin flexible PSCs fabricated on PET film, characterized by a promisingly high specific power and possible space applications varying from ultra-light weight solar panels for satellites to printed production during the mission. Further, we also report preliminary results of studies performed on radiation tolerance of our flexible PSCs. To the best of our knowledge, this is the first systematic study of radiation tolerance on flexible PSCs. The cells were irradiated with 100 keV protons (more damageable than 1 MeV electrons) from the backside with the fluence range from $3 \times 10^{10}$ to $3 \times 10^{12}$ protons/cm². The results showed little degradation of light current-voltage (Fig. 1a) and spectral response (Fig. 1b) characteristics up to the fluence of $3 \times 10^{11}$ protons/cm², revealing high radiation resistance of our flexible PSCs successfully justifying their possibility for space application.

**Fig.1** Characteristics of PSCs before (initial, BOL) and after (irradiated, EOL) 100 keV proton irradiation with the fluence of $3 \times 10^{11}$ protons/cm².