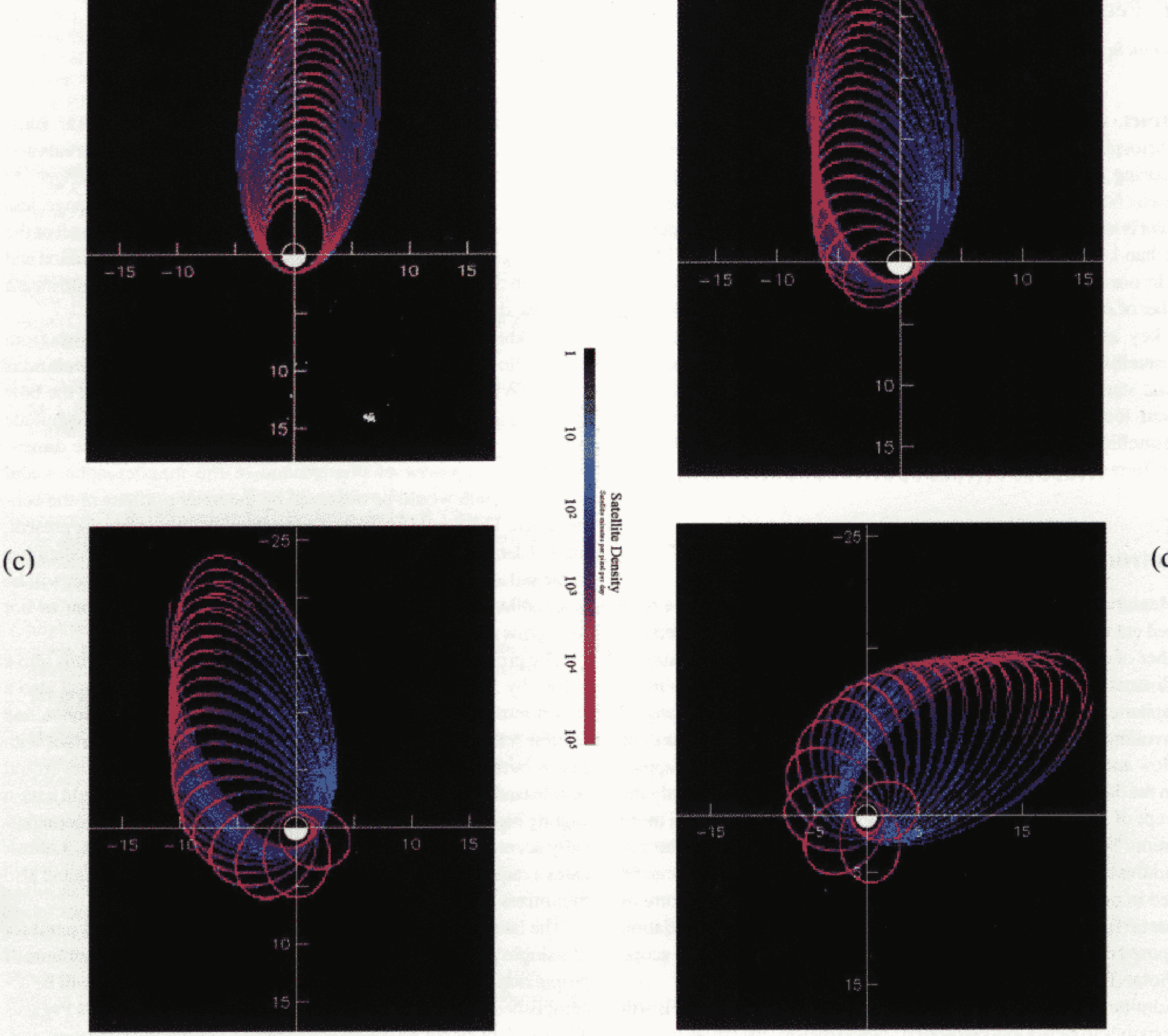

Figure 1. Constellation drift over a three year period. Density or frequency of occurrence in a specified area in arbitrary units a) at launch and b), c) and d) after one, two and three years. Shows that high spatial resolution can be maintained for several years.

satellites, individual failures correspond only to loss of the data from those satellites, not to an overall system failure. Designing to 99% reliability would correspond to loss of only 1% of the data. The associated reduction in redundancy can correspond to significant mass reduction.

In the following sections, we discuss several critical aspects of implementing a constellation of this type. These elements are summarized below. Section II will discuss drifts and precession of the satellite orbits, showing that the configuration retains reasonable coherence over several years. Radiation exposure on the selected orbits is also calculated. It becomes as high as 1Mrad/yr for some of the satellites. As discussed in later sections, this is taken into account in selection of satellite components and passive shielding.

Section III will discuss the required data rates and the resulting requirements on the communication link, in particular: transmitter antenna requirements, transmission power and receiver properties.

Section IV discusses the design of the satellite and its critical c ponents as well as the status of a breadboard of the electronics w is presently under construction within the Boston University Ce for Space Physics. This includes estimates of the power and mas quirements.

Section V discusses the launch scenario using a Pegasus XL lau vehicle. The analysis includes the propulsion requirements of the the packaging of the satellites in the bus and some aspects of the s lite release mechanisms.

Section VI discusses some aspects of the ground station requ ments such as number and distribution of stations, satellite acquis and tracking.