Purpose:
While for air filled ionization chambers an approximately energy invariant response leads to an approximately position invariant calibration factor, silicon diodes express over response for low energy photons. This results in too high signals at large depth inside a photon field and outside the geometric field. However use of a silicon diode is appropriate due to its high spatial resolution. We measured the behaviour of the calibration factor for different commercially available Si-detectors and compared it with the behaviour of a small ionisation chamber (IC). The aim was to find a position dependent correction for Si-diodes.

Methods:
Depth dose curves and profiles were measured for five different Silicon diodes; i.e. the Scanditronix field photon (ye) and the stereotactic detector (gr), the PTW electron (pe) and photon diodes (pp) and the Sun Nuclear edge detector (se). The standard field size, 10x10cm² and a 0.8x0.8cm² field were investigated. The energies were 6MV and 10MV.

Results:
To compare the depth dose measurements the signal ratios at 20cm and 10cm depth were calculated. The difference between the diode signals was less than 3%. The “pp” and the “pe” signals were the closest to the ionization chamber signal ratio at the 10cm field.
For the profiles, besides the penumbra, the signals outside the geometrical field differed significantly form the IC signal. By appropriate averaging of the diode signals and division with the IC signal we could derive correction factors for the different detectors. For the large field this correction was smaller 1. For the small field the correction became greater than 1, but only at points blocked by the MLC only.

Conclusions:
We propose to measure virtually simultaneously with a diode and an IC in order to correct the energy and hence spatial dependent diode response factor. This correction is otherwise hardly predictable.