

In images acquired by confocal laser scanning microscopy (CLSM), regions corresponding to the same concentration of fluorophores in the specimen should be mapped to the same grayscale levels. In practice, due to multiple distortion effects, CLSM images of even homogeneous specimen regions exhibit irregular intensity variations, e.g. darkening of image edges and lightening of the centre (Fig.1a). A spatially varying grayscale map complicates image postprocessing e.g. in image stitching of neighbouring fields of view or in registration of images of successive sections for three-dimensional (3D) reconstruction. We present a fast correction method based on estimating a spatially variable gain which models the adverse effects of uneven illumination, and multiplying acquired CLSM images by the inverse of the estimated gain. The estimation is done from the CLSM image itself, not from some kind of a reference image. The proposed approach exploits two types of morphological filters: the median filter and a morphological operator called the upper Lipschitz cover.