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Arcseconds and Sub-Arcseconds Imaging with Multi Image X-ray Interferometer Modules for Small Satellites

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The best angular resolution of 0.5 arc-second is realized with the X-ray mirror aboard the Chandra satellite. Nevertheless, further better or comparable resolution is anticipated to be difficult in near future. We propose a new type of X-ray interferometer consisting simply of an X-ray absorption grating and an X-ray spectral imaging detector, such as X-ray CCDs or CMOS detectors, by stacking the multi images created with the Talbot interference (Hayashida et al. 2016). This system, we call Multi Image X-ray Interferometer Module (MIXIM), enables us arcseconds and sub-arcseconds resolution of the X-ray targets. Although the targets of MIXIM are limited to relatively bright sources, as we do not employ collecting mirrors, unique scientific theme, such as, search for super massive black holes and resolving AGN torus would be possible. We introduce the concept of the MIXIM and some results of the ground experiment, in which arcseconds resolution has been achieved with the XRPIX2b detector fabricated with SOI process. Satellite plans of MIXIM raging from arcseconds resolution with a very small satellite to 10 milli-arcseconds resolution with a medium size satellite are also shown.

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