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Wide-field imaging by leakage of surface plasmon-coupled fluorescence CATHERINE CHESNUTT, STEPHEN FRISBIE, LUIS GRAVE-DE-PERALTA, AYRTON BERNUSSI, Texas Tech University — In this work we present a new imaging technique that combines advantages of wide-field surface plasmon (WFSP), leakage radiation (LR) and total internal reflection florescence (TIRF) microscopy methods. We demonstrate high-resolution non-scanning (wide-field) imaging of fluorescent samples using a LR configuration. We modified the glass-metal-sample arrangement to be imaged by adding a top thin film with a refractive index equal to or smaller than the glass. The top thin film is fabricated by spinning a diluted fluorescent compound (dye) over the original glass-metal-sample arrangement. Illumination from a low numerical aperture microscopic lens is used to excite incoherent fluorescent radiation in the top thin film. Leakage radiation due to plasmon-coupled fluorescence is collected by an oil-immersion microscope objective lens in direct contact with the glass side of the sample arrangement. The use of incoherent plasmon-coupled fluorescent radiation for sample illumination dispenses the need of a rotating diffuser in the proposed wide-field leakage plasmon-coupled fluorescence (WFLPCF) microscope. This also provides a way to obtain high resolution non-scanning images without the need of a spatial modulator.

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