

POWER SPECTRUM OF RADIATION
FROM A GAUSSIAN SOURCE
MICROLENSED BY A POINT
MASS: ANALYTIC RESULTS

V.I. Zhdanov^{1,2}, D.V. Gorpinchenko²

¹Taras Shevchenko National University of Kyiv,
Astronomical Observatory
(*3, Observatorna Str., Kyiv 04053, Ukraine;*
e-mail: ValeryZhdanov@gmail.com),

²National Technical University of Ukraine
“Kyiv Polytechnic Institute”
(*37, Prosp. Peremogy, Kyiv 03056, Ukraine*)

S u m m a r y

Gravitational lensing deals with general-relativistic effects in the propagation of electromagnetic radiation. We consider wavelength-dependent contributions in case of a (micro)lensing of an extended Gaussian source by a point mass under standard assumptions about the incoherent emission of different source elements. Analytical expressions for the power spectrum of a microlensed radiation, which are effective in case of a large source, are obtained. If the source center, the mass, and an observer are on a straight line, the power spectrum is found in a closed form in terms of a hypergeometric function. In the case of general locations of the lens and the source, the result is presented in the form of a series. Approximate analytic expressions for the power spectrum in the case of a large source and high frequencies are obtained.