Comments on our gravitational lensing papers

  “We calculate the amplitude of the GW echo for a source at radius \( r \) from the SMBH in the geometrical optics limit using the Virbhadra & Ellis (2000) lens equation valid for arbitrary deflection angles.”

  “Based on the Virbhadra-Ellis lens equation, Bozza et al. [15] proposed a new and reliable method to obtain the deflection angle in the strong field limit for a Schwarzschild black hole lensing, where only the first two leading order terms were retained.”

  “We have employed the Virbhadra-Ellis lens equation, presenting sufficient accuracy for our first order approach…”
  “…we refer the reader to Ref. [9] and references therein and to Refs. [10] for pioneering contributions on strong gravitational lensing…”

• A. Y. Bin-Nun, Class. Quantum Grav. 28, 114003 (2011).
  “In 2000, Virbhadra and Ellis [14] revived interest in the study of very strong gravitational lensing. ... The results in these studies were derived by numerically solving the Virbhadra-Ellis lens equation for the image position and for the image magnification.”

  “The apparent angle \( \theta \), under which an image appears, is found from the Virbhadra-Ellis lens equation [9,16]: ... We have employed the Virbhadra-Ellis lens equation, presenting sufficient accuracy for our first order approach.”


  “Virbhadra and his collaborators\(^3\)–\(^8\) introduced the idea of gravitational lensing to determine the nature of singularity. In one of his papers\(^9\), he presented an improved version of the CCH, which is a source of inspiration for researchers.”

  “Using the concept of gravitational lensing (GL), Virbhadra et al. [23] introduced a new tool for examining naked singularities. ... The same author developed an improved form of CCH using GL phenomenon [29].”

  “Once we can calculate the bending angle of a null geodesic as a function of \( r_o \), the results are used in conjunction with the Virbhadra-Ellis lens equation [5]: ...”

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• **V. Perlick**, Newsletter, Institute of Physics, Gravitational Physics Group 4, 16 (2008).

"Of all these simplified lens equations, the one by Virbhadra and Ellis [8] has found the biggest resonance in the literature. ... the Virbhadra-Ellis lens equation does not restrict the light rays to the asymptotic region where the spacetime is almost flat."


"With their outbreaking paper about the possibility of observing higher order images around the black hole at the center of our Galaxy [11], Virbhadra and Ellis have attracted great attention on gravitational lensing beyond the weak deflection approximation, inspiring new vitality in black hole gravitational lensing. They have also proposed a new lens equation that has become very popular in the scientific literature."

• **V. Perlick**, arXiv:gr-qc/07.08.017[gr-qc].

The Virbhadra-Ellis lens equation was originally applied to the Schwarzschild spacetime and later also to other spherically symmetric static spacetimes. ... The Virbhadra-Ellis lens equation might be called an "almost exact lens equation".


"In order to the Virbhadra-Ellis lens equation be valid, the spacetime must be asymptotically flat and both the observer and the light sources must be far away from the lens."


"Since the publication of the paper of Virbhadra and Ellis[2], there has been a growing interest in the study of lensing by black holes. ..."


"The study of strong gravitational lensing was resurrected recently by Virbhadra and Ellis[12], who studies lensing by the galactic supermassive black hole, in an asymptotically flat background. ..."


"Virbhadra and Ellis (2002) fill a compelling void in both General Relativity and astrophysics by providing a gravitational lens equation for observationally testing the Penrose Cosmic Censorship Hypothesis with a cosmic telescope."


"Recently, a paper by Virbhadra and Ellis has renewed interest in such images, which they called relativistic images [8]. ..."


"... The Virbhadra-Ellis lens equation has found considerable interest. ..."


"A recent paper by Virbhadra and Ellis [5] has risen a new interest about gravitational lensing as a probe for strong gravitational fields generated by collapsed objects, providing a new important test for the full general relativity. "