



SDI Review Form 1.6

Journal Name:	Physical Review & Research International
Manuscript Number:	2013_PRRI_6718
Title of the Manuscript:	Focusing of Optical Vector-vortex Beams
Type of the Article	Research Paper

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This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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SDI Review Form 1.6

PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	<p>The work itself is completed, and has some significance to the community. Here are my comments to be addressed to make paper ready for publication:</p> <ol style="list-style-type: none"> 1. Most of the simulation results can be referred to the Figures in the manu, but the scale sizes are too small to be viewed. Especially the "80 lamda" cannot be recognized in Fig. 6. 2. The word "equation" shorten as "Eqn." and "Equ." in the manu, please uniformize them. 3. "Richadson-Wolf" in the manu may be "Richards-Wolf"? 4. In eq. 9(c), "z" seems to be missed. 5. In fig. 1, the author should depict the locations of "z=0" and "A". 6. The description of the experiment (after Eq. 9) is oversimplified and is obviously different from that in Ref. 25. "Two half-wave plates are used after the collimated fiber output to rotate the spatial polarization state of the vector beam ...", which is inaccuracy because a sandwich-structure should be introduced. (see ref. 1 and 25). The scale bars of Fig. 3 (b,c,e,f) should be provided. 	<ol style="list-style-type: none"> 1. The font sizes of scales in all figures are increased for clarity. We have also included the line profile of the axial intensity with distance (in Figs 4 and 6) which makes it clear to read the distances, especially the depth of focus of 80λ. 2. The changes are incorporated in the manuscript accordingly to uniformly read equ(s). 3. Correction suggested is incorporated. 4. The term 'z' is not present in the Eq.9(c). We realized the mistake in earlier equations and have corrected it. 5. The location of $z=0$ in Fig. 1 is the output plane (pupil) of the axicon 'A' and is indicated. 6. As suggested the experimental details for the generation of cylindrical vector beams from the two-mode optical fiber is added in the manuscript. Two cascaded half-wave plates (similar to that used in Fig. 8 in Ref. 1 and Fig 2 in Ref 3) are used to rotate the spatial state of polarization of the beam generated by the two-mode fiber to achieve radial, azimuthal and generalized vector beams. We have included these references in the manuscript. Figs. 3 (b,e) are the polarization ellipse patterns of the central part of the beam where green colour refers to right circulating polarization ellipses and red colour refers to



SDI Review Form 1.6

		<p>left circulating polarization ellipses. Scale bars for Figs.3 (c,f), which are the polarization ellipse orientation angle, is given in the figure. The polarization ellipse orientation angle varies from $-\pi/2$ rad to $\pi/2$ rad.</p>
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SDI Review Form 1.6

<u>Minor</u> REVISION comments	7. In Fig. 2, why the intensity distribution in $z=0$ plane are not zero. (The intensity in $z=0$ seems to be zero according to Eq. 7) and why the intensity distribution near the focal region is not symmetrical to $z=0$ plane.	7. We would like to point out that following the conventions in the literature for focusing with lens, $z=0$ corresponds to the focal plane [see Ref. 3], whereas $z=0$ corresponds to the exit pupil of the axicon [Ref. 22]. This is mentioned in the text to avoid misunderstanding. It is also important to realize that in high-NA focusing of even scalar beams both transverse E_t longitudinal E_z field components contribute to the total intensity behaviour as a function of propagation distance. We have modified Fig 2 to include the component and total fields along with the line profile at $z = 0$ to clarify the beam symmetry aspect.
<u>Optional/General</u> comments	Some expressions in the manu are misleading. 8. In the abstract “the focusing process leads to interference between different field components of the beam...”, in my opinion, different field components are independence and cannot interference with each others. 9. In introduction, “Optical beams with spatially varying state of polarization are known as cylindrical vector beams”. Strictly speaking, only the spatially varying state of polarization with cylindrical symmetric can be defined as CV beams. 10. The results in the figures are cylindrical symmetric, why the equations use the Descartes coordinate (E_x , E_y , E_z).	8. We have clarified this point in the manuscript (pg. 6, line 172) to mean that we measure the total electric field component resulting due to the superposition of orthogonal circular polarized J_0 and J_2 components of the beam at each imaging plane. 9. The manuscript is corrected accordingly 10. The mathematical formalism developed here is based on the theoretical equations given in Ref. [22]. We convert between the coordinate systems used in the equations and figures to suit the convenience of experimental measurements and to compare with the existing literature in this area.