REFEREE’S REPORT
ON THE MANUSCRIPT ID: JPHYSA-102329


1. COMMENTS TO THE EDITOR AND THE AUTHORS

This paper by Ridout and Wood is a very interesting and significant contribution to conformal field theory, exploiting and clarifying the deep connections between free field realizations and the extensive theory of symmetric polynomials. This paper concentrates on the applications to Virasoro minimal models, but has more general applications. The results presented had been discovered by other authors using more complicated proofs, so the main point of this paper is to show how those proofs can be significantly simplified using the theory of symmetric polynomials (in particular, the Jack polynomials).

I recommend that this paper be accepted for publication in the Journal of Physics A: Mathematical and Theoretical.

I have noted all the typographical errors I could find in my comments below, some of which have mathematical content, and some are just for the writing and exposition.

2. COMMENTS TO THE AUTHORS

(1) Page 3, Line 19: In equation (2.13) the formula $\alpha \pm = \frac{\alpha_0 \pm \sqrt{\alpha_0^2 + 8}}{2}$ should be $\alpha \pm = \frac{\alpha_0 \pm \sqrt{\alpha_0^2 + 8}}{2}$ to give the roots of the polynomial $\lambda^2 - \alpha_0 \lambda - 2$.

(2) Page 6, Line 10: In the formula (2.38), in the last product expression on the right side, why is the power of $z_i$ equal to $k - 1$?

(3) Page 7, Line 6: In your definition of the partition $\lambda = (\lambda_1, \ldots, \lambda_k)$, you did not say that the parts of the partition are in the order $\lambda_1 \geq \cdots \geq \lambda_k$. Perhaps it would be enough to just write “... be a partition of an integer with largest part $\lambda_1 \leq n$.

(4) Page 7, Line 11: It seems strange to be calling the sums in formula (3.5) “monomials”, since a monomial is usually just one such term, but if that is the name given to them by Macdonald, who can object.

(5) Page 7, Line 24: In displayed expression (3.8) are we to understand the power sums are now each infinite sums $p_i = \sum_{j=1}^{\infty} z_j^i$ and that is the meaning of
the $p_i$ in (3.22)? Then for each partition $\lambda = (\lambda_1, \ldots, \lambda_k)$, the product $p_\lambda = p_{\lambda_1}(z) \cdots p_{\lambda_k}(z)$ is an infinite sum involving all variables.

(6) Page 8, Line 24: In the top line of equation (3.15) I think the condition $\ell(\mu) \leq n$ should be $\ell(\lambda) \leq n$.

(7) Page 11, Line 8: I suggest a slightly smoother way of writing the beginning of the sentence as “As a final exercise, to truly show the power of combining the screening operator and symmetric polynomial formalisms, we will ...”.

(8) Page 11, Line 7 up from the bottom: “... centred about ...” should be “... centered about ...”.

(9) Page 11, Line 6 up from the bottom: In formula (4.10) should the last subscript in $dz_1 \cdots dz_n$ be $n$? Perhaps you mean that $n = p_+ - 1$. This also happens in the first line of displayed equations (4.14).