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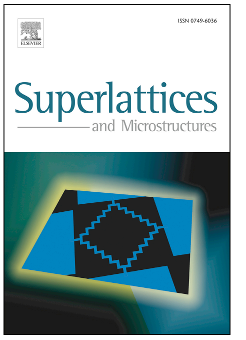

Reply of the manuscript of authors (Elsayed and Abdul-Ghani) in title (Comment on the paper of our paper [Superlattices and Microstructures, 113 (2018) 346–358]) (in press)

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Reply of the manuscript of authors (Elsayed and Abdul-Ghani) in title (Comment on the paper of our paper [Superlattices and Microstructures, 113 (2018) 346-358]) (in press)

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Abstract The used methods in our papers [1]- [13] named new modified and extended auxiliary equation methods. The calculations of our article were correct. All solutions satisfied the partial differential equations in our papers.

Keywords New auxiliary equation method; Maple; Mathematical methods; Mathematical Physics.

1 Reply in details:

They told our paper in Superlattices and Microstructures, 113 (2018) 346-358] [1], the calculation are not correct.
The proof of our calculation are correct as following:
Comment Number 1.
$a^f(\xi)$ given by (3) does not satisfy Eq. (2). To prove this, we see that:

$$a^{f(\xi)} = -\frac{\beta}{2\,\sigma} + \frac{\sqrt{-(\beta^2 - 4\,\alpha\,\sigma)}}{2\,\sigma}\,tan(\frac{\sqrt{-(\beta^2 - 4\,\alpha\,\sigma)}}{2}\,\xi), \tag{1}$$

Now, by simple calculation, we have:

$$[\alpha\,a^{-f(\xi)} + \beta + \sigma\,a^{f(\xi)}] \;= \frac{\left(\left(\alpha - \frac{\beta^2}{\sigma}\right)\left(\sec\left(\frac{\xi}{2}\sqrt{\alpha\,\sigma - \beta^2}\right)\right)^2 - \frac{\beta\sqrt{\alpha\,\sigma-\beta^2}\tan\left(\frac{\xi}{2}\sqrt{\alpha\,\sigma-\beta^2}\right)}{\sigma} + \frac{\beta^2}{\sigma}\right)}{\left(-\frac{\beta}{\sigma} + \frac{\alpha\,\sigma - \beta^2}{\sigma}\tan\left(\frac{\xi}{2}\sqrt{\alpha\,\sigma-\beta^2}\right)\right)}. \tag{2}$$

From (3) we conclude that

$$f'(\xi)\,ln(a) = \frac{0.5\,\left(\alpha - \frac{\beta^2}{\sigma}\right)\left(\sec\left(\frac{\xi}{2}\sqrt{\alpha\,\sigma - \beta^2}\right)\right)^2}{-\frac{\beta}{\sigma} + \frac{\sqrt{\alpha\,\sigma-\beta^2}\tan\left(\frac{\xi}{2}\sqrt{\alpha\,\sigma-\beta^2}\right)}{\sigma}}. \tag{3}$$

where $' = d/d\xi$: Note that the R. H. S of formula (8) is not equal to the R. H. S of formula (9). Thus the formula (3) is not a solution of Eq. (2).
The Reply for this comment:

$$\frac{1}{ln(a)}\,[\alpha\,a^{-f(\xi)} + \beta + \sigma\,a^{f(\xi)}] \;= \frac{\alpha}{\ln(a)} a^{\frac{\ln(2)}{\ln(a)}} \left(a^{\frac{1}{\ln(a)}\ln\left(-\frac{\beta}{\sigma} - \frac{\sqrt{-4\,\alpha\,\sigma+\beta^2}\tanh\left(0.5\sqrt{-4\,\alpha\,\sigma+\beta^2}\xi\right)}{\sigma}\right)} \right)^{-1} + \frac{\beta}{\ln(a)} \tag{4}$$
$$+\frac{\sigma}{\ln(a)} a^{\frac{1}{\ln(a)}\ln\left(-\frac{\beta}{\sigma} - \frac{\sqrt{-4\,\alpha\,\sigma+\beta^2}\tanh\left(0.5\sqrt{-4\,\alpha\,\sigma+\beta^2}\xi\right)}{\sigma}\right)} \left(a^{\frac{\ln(2)}{\ln(a)}}\right)^{-1}.$$