CONCERNING THE DESIGN OF TRANSPIRATION COOLING WITH THE RADIATIVE COMPONENT OF EXTERNAL HEAT TRANSFER INCLUDED

M. D. Mikhailov

In his comment, V. L. Chumakov attempts to extend the results in [1] to the case of combined convective and radiative heat transfer from the hot surface of a porous body. The solution to this problem can be easily found by means of the analytical formula for the equilibrium temperature [2]. The solution is

$$\theta(\xi)=\theta_0+\left(\sqrt{\frac{g+\mathrm{Bi}}{\mathrm{Sk}}\frac{y}{8y}}-\frac{y}{2}-\sqrt{\frac{y}{2}}-\theta_0\right)f_r(\xi),$$

where

$$y=\sqrt[3]{\left(\frac{g+\mathrm{Bi}}{4\mathrm{Sk}}\right)^2+\sqrt{\left(\frac{g+\mathrm{Bi}}{4\mathrm{Sk}}\right)^4+\left(\frac{1}{3}+\frac{\mathrm{Bi}+g(\theta_0-K)}{3\mathrm{Sk}}\right)^3}}$$
$$+\sqrt[3]{\left(\frac{g+\mathrm{Bi}}{4\mathrm{Sk}}\right)^2-\sqrt{\left(\frac{g+\mathrm{Bi}}{4\mathrm{Sk}}\right)^4+\left(\frac{1}{3}+\frac{\mathrm{Bi}+g(\theta_0-K)}{3\mathrm{Sk}}\right)^3}}.$$

As to the misprints (they appear also in formulas (2) and (4) in the text of [1]); the author did not call for their correction, inasmuch as they do not affect the final results.

LITERATURE CITED

1. M. D. Mikhailov, Inzh. Fiz. Zh., 9, No. 2, 264-265 (1966).
2. Yu. V. Abramovich and P. N. Kobtsev, Inzh. Fiz. Zh., 21, No. 3, 550-552 (1971).

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