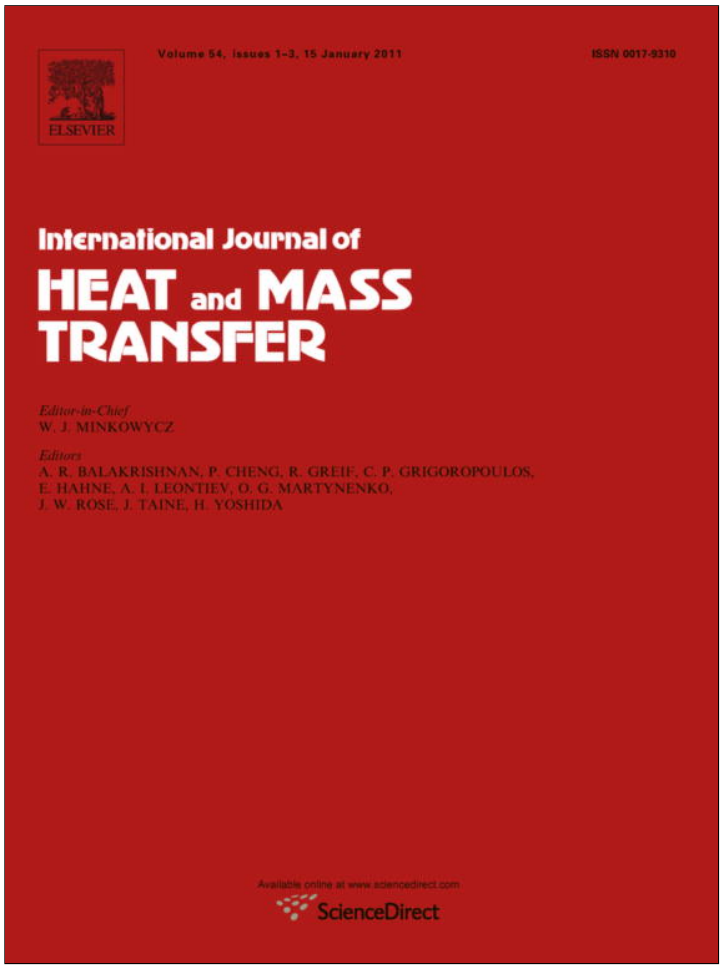

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Erratum

Erratum to "A study of the Sherwood–Rayleigh relation for water undergoing natural convection-driven evaporation" [Int. J. Heat Mass Transfer 52 (2009) 3055–3063]

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The authors regret that the computation of the evaporative mass flux from the tank $\dot{m}''$ failed to account for the flow from the beaker to the tank. As a consequence, Eq. (20) in the original paper should be replaced with the following five equations and accompanying text:

$$\rho g(h_b - h_t) = RQ \tag{1}$$

where h_b and h_t are the heights of the water in the balance beaker and tank, respectively, and Q is the volumetric flowrate of water through the siphon tube. Assuming laminar, steady-state, fully developed pipe flow, the fluid resistance is given by $R = (128\ \mu L)/(\pi d^4)$ where L is the length of the siphon tube, and d is the tube diameter. The fluid inertance is neglected. By conservation of mass, the flowrate through the siphon Q is:

$$Q = -A_b \frac{dh_b}{dt} \tag{2}$$

The rate of change of the fluid height in the tank is therefore proportional to the sum of the siphon flowrate, Q, and the evaporative flowrate, Q_{ev}

$$Q + Q_{ev} = A_t \frac{dh_t}{dt} \tag{3}$$

By combining Eqs. (1) and (2), solving for h_t and taking its derivative with respect to time we obtain:

$$\frac{dh_t}{dt} = \frac{A_b R}{\rho g}\frac{d^2 h_b}{dt^2} + \frac{dh_b}{dt} \tag{4}$$

Combining Eqs. (3) and (4) and solving for the evaporative mass flux from the tank $\dot{m}''$ gives:

$$\dot{m}'' = \left(\frac{A_b}{A_t} + 1\right)\frac{(dm/dt)_b}{A_b} + \frac{R}{\rho g}\left(\frac{d^2 m}{dt^2}\right)_b \tag{5}$$

The above correction to Eq. (20) results in a change in the prefactor and exponent in the reported Sh–Ra power law relationship. The correct relationship is $Sh = 0.316Sc^{1/3}Ra^{0.306}$. The prefactor and exponent appear in five other locations in the paper and should be corrected to read as follows:

- The fifth sentence of the abstract should read: "The resulting power law is $Sh \sim Ra^{0.306}$."
- The values of the prefactor and exponent in the first line in Table 1 should read: "$B = 0.316$" and "$n = 0.306$", respectively.
- Eq. (26) should read:

$$Sh = 0.316Sc^{1/3}Ra^{0.306} \tag{6}$$

- The caption in Fig. 6 should read: "...which gives $B = 0.316$ and $n = 0.306 + 1$."
- The third sentence of the conclusion should read: "The resulting Sh–Ra power law exponent was $n = 0.306 \pm 0.0096$ and the prefactor was $B = 0.316 \pm 0.0383$."

Unrelated to the above correction to $\dot{m}''$, the following correction should also be made:

- The right-side y-axis label of Fig. 4 should read: "Mass Loss Rate/(kg/s)".

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