

CORRIGENDUM

Corrections to "Dynamics of Weather Regimes: Quasi-Stationary Waves and Blocking"

BRIAN B. REINHOLD AND R. T. PIERREHUMBERT

The authors have become aware of a number of typographical errors and one algebraic error in Reinhold and Pierrehumbert 1982, (hereafter RP). The typographical errors in the body of the text are as follows:

- 1) In Eq. (2.1) the Ekman friction term in the equation for τ should read $-k''\nabla^2(\tau - \psi)$ instead of $-k''\nabla^2\psi$.
- 2) The symbols h_j in (2.4) and throughout the Appendix should be replaced by h_j , the topographic height expansion coefficients defined in (2.3). The symbol h_2 used in the description of the cases is the actual height of the mountain, and is related to the modal coefficient by $h_2 = 2h_2$.
- 3) In the sum multiplying β in the final line of (2.4), the term $b_{ij}\theta_j/a_i^{-2}$ should read $b_{ij}\theta_j a_i^{-2}$.
- 4) The normalization factors multiplying the integrals in the definitions of c_{ijk} and b_{ij} following Eq. (2.4) should read $1/\left[\int\int F_i^2 dx dy\right]$.

In addition there are the following typographical errors in the Appendix:

- 1) In the equation for $\dot{\psi}_8$ the coefficient c_2 in the first term should be c_3 , and the friction term should read $-k(\psi_8 - \theta_8)$ instead of $-k(\psi_7 - \theta_7)$.
- 2) In the equation for $\dot{\theta}_5$ the coefficient multiplying $(\psi_3\theta_7 - \psi_2\theta_8)$ should be $(1 + 3\sigma_0 n^2)$ instead of $(1 - 3\sigma_0 n^2)$.
- 3) In the equation for $\dot{\theta}_8$ the coefficient c_3 in the first term should be divided by $(4n^2 + 1)$.

The algebraic error is as follows:

In the equations for the tendencies of the shortest wave components retained in the model ($\psi_9, \psi_{10}, \theta_9, \theta_{10}$), the factors $(4n^2 + 3)$ in the terms involving c_5 should be $(4n^2 - 3)$. These modes are not the waves that are primarily responsible for baroclinic instability in the model, but they can affect the equilibrated amplitudes of the baroclinic eddies through nonlinear in-

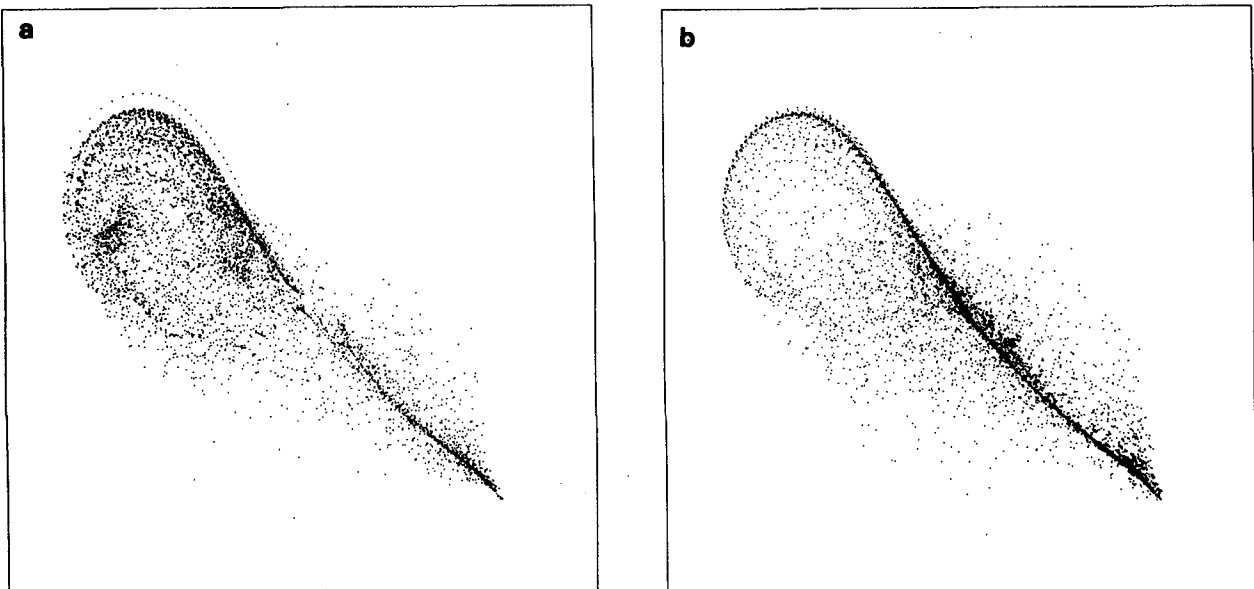


FIG. 1. Plots of the ψ_3, ψ_2 components of the phase space position each day during a 17-year period of integration. Parameter settings and graphical conventions are identical to Fig. 3 of Reinhold and Pierrehumbert (1982). (a) Results with equations used in Reinhold and Pierrehumbert (1982), (b) Results with the corrected equations.

teractions. To assess the import of this error, the model was programmed anew by the authors without recourse to the original code, and the "demonstration case" of RP re-run with the original and corrected equations. The attractor for the equations used in RP is shown in Fig. 1a, and is essentially the same as Fig. 3 of RP. The attractor for the corrected model is shown in Fig. 1b; it looks much the same as the original attractor, and in particular still has the same two-regime structure. The main difference is that the trough regime (consisting of the line of points at the lower right of the attractor) becomes somewhat more populated at the expense of the ridge regime. Though it cannot be inferred from Fig. 1b, the ridge regime tends to be somewhat less persistent in the corrected model. Although there are quantitative differences, the regime phenomenon nonetheless appears in the same qualitative form in both systems. These results have been verified against computations performed independently by Priscilla Cehelsky of the Massachusetts Institute of Technology.

There is perhaps some benefit to be derived from this inadvertent experiment in structural stability. In a severely truncated model, the dynamics of the highest order component retained cannot be expected to bear much resemblance to reality. The fact that the weather regime phenomenon survives rather drastic changes in the equations for this component suggests that the phenomenon is not an artifact of the truncation.

Acknowledgments. The authors are indebted to Priscilla Cehelski and K-K Tung of the Department of Mathematics, M.I.T., for pointing out the algebra error noted above. We are also grateful for their generous assistance in verifying the corrected model.

REFERENCE

- Reinhold, B. B., and R. T. Pierrehumbert, 1982: Dynamics of weather regimes: Quasi-stationary waves and blocking. *Mon. Wea. Rev.* **110**, 1105-1145.