amplitude. The value of $W$ for this scenario was obtained as the fraction of the number of wavenumbers with two turning latitudes divided by the number of all wavenumbers allowing wavelike behavior within the jet region. The resulting values are represented as the other edge of the blue-shaded area in Fig. 6. Apparently, there is now a more gradual transition from $W = 0\%$ to $W = 100\%$ as jet amplitude and jet width are varied, but the transition is still significantly steeper than for the values obtained from the simulations. In addition, the scenario with equal amplitude for all relevant zonal wavenumber is not realistic, either, because even for very weak jets our numerical solutions indicate a maximum spectral amplitude as some intermediate wavenumber. In the end, the best estimate for a “fair” prediction from ray tracing theory is a line which is located somewhere in the middle of the blue shaded area in Fig. 6. This behavior is due to the fact that within this range of $U_J$-values the profiles of $\hat{K}_s(\phi)$ are practically independent of $U_J$. This, in turn, is related to the fact that for narrow strong jets the meridional gradient of absolute vorticity is dominated by the meridional curvature of the background wind field. In this case the meridional gradient of background PV (6) can be approximated as

$$\frac{dq_0}{a d\phi} \approx -\frac{1}{a^2} \frac{d^2u_0}{d\phi^2}$$

and, using (22), (23), and (30), one obtains

$$\hat{K}_s^2 \approx -\frac{\cos^2 \phi}{u_0} \frac{d^2u_0}{d\phi^2}.$$