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Cosmic Neutrino Flavor Ratios with Broken ν_μ–ν_τ Symmetry LINGJUN FU, CHIU MAN HO, THOMAS WEILER, Vanderbilt University — Reactor experiments have very recently measured the neutrino mixing angle θ_{13}, the final angle in the trilogy. Reactor neutrino experiments have now observed a nonzero value for θ_{13} at 5σ, and global fits to data imply a nonzero value above 10σ. Nonzero values for θ_{13} and/or θ_{32}-$\frac{\pi}{4}$ break a ν_μ-ν_τ symmetry, which has qualitative as well as quantitative implications for the time-evolution of neutrino flavors. In particular, the large-distance flavor evolution matrix, non-invertible with ν_μ-ν_τ symmetry, is now invertible. This means that measurements of neutrino flavor ratios at Earth can now be inverted to directly reveal the flavor ratios injected at cosmically distant sources. With the updated values of the three neutrino mixing angles, we obtain the inverted large-distance evolution matrix and use it to derive several phenomenological relations between the injection flavor ratios and the observable ratios at Earth. Taking the three popular injection models as examples, we also exhibit the shift of Earthly observed flavor ratios from the corresponding values in the case with ν_μ-ν_τ symmetry.

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