

A CLOSURE MODEL WITH PLUMES STOCHASTIC EXCITATION OF STELLAR P MODES

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Abstract. Oscillations of stellar p modes excited by turbulent convection are investigated. Our modelling including the entropy contribution however now over-estimates, at high frequency, the power and calls for further theoretical improvements.

1 Introduction

In the uppermost part of the solar convective zone, turbulent entropy fluctuations and motions of eddies drive acoustic oscillations.

2 Closure models for turbulent convective layers

The QNA assumption permits the fourth-order turbulent vertical velocity correlations to be decomposed in terms of a product of second-order ones, that is one uses

$$\langle w'^4 \rangle_{QNA} = 3 \langle w'^2 \rangle^2. \quad (2.1)$$

where w' is the turbulent vertical velocity.

With the Reynolds stress contribution alone closer to (although, at intermediate frequency, still below) the observations (Fig. 1).

References

Einstein, A., 1926, ApJ, 63, 196

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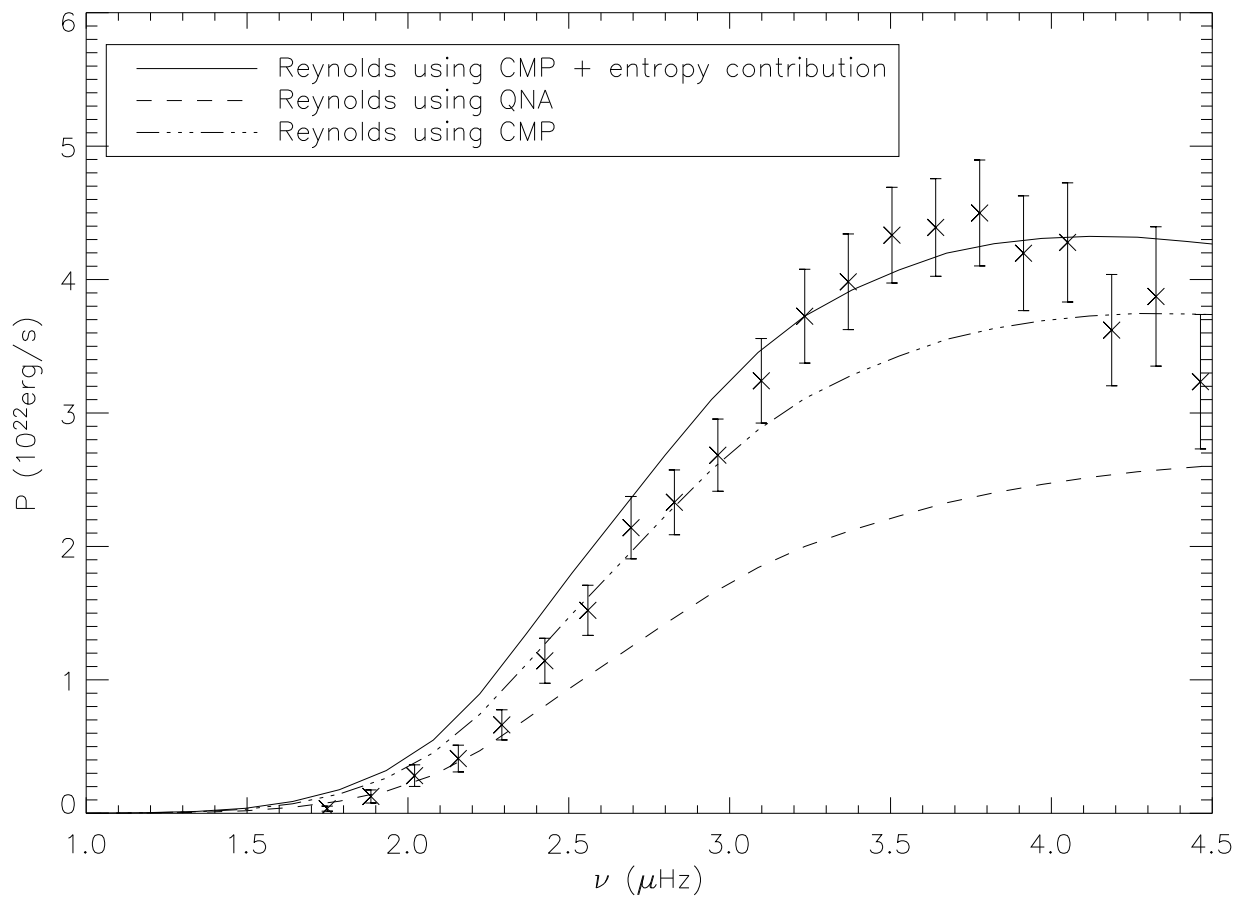


Fig. 1. Rate P at which acoustic energy is injected into the solar radial modes.