

## PACKING MEASURES AND DIMENSIONS ON CARTESIAN PRODUCTS

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**Abstract:** Packing measures  $\mathcal{P}^g(E)$  and Hewitt-Stromberg measures  $\nu^g(E)$  and their relatives are investigated. It is shown, for instance, that for any metric spaces  $X, Y$  and any Hausdorff functions  $f, g$

$$\nu^g(X) \cdot \mathcal{P}^h(Y) \leq \mathcal{P}^{gh}(X \times Y).$$

The inequality for the corresponding dimensions is established and used for a solution of a problem of Hu and Taylor: If  $X \subseteq \mathbb{R}^n$ , then

$$\inf\{\overline{\dim}_p X \times Y - \overline{\dim}_p Y : Y \subseteq \mathbb{R}^n\} = \liminf_{X_n \nearrow X} \underline{\dim}_B X_n.$$

Corresponding dimension inequalities for products of measures are established.

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**Key words:** Packing measure, lower packing measure, packing dimension, lower packing dimension, cartesian product.