

## Powers of Sums of Ideals

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Let  $A = k[x_1, \dots, x_r]$  and  $B = k[y_1, \dots, y_s]$  be polynomial rings over a field  $k$ , and let  $I \subseteq A$  and  $J \subseteq B$  be nonzero proper homogeneous ideals. We shall discuss algebraic invariants and properties of both symbolic and ordinary powers of the ideal  $I + J \subseteq R = A \otimes_k B$ . This investigation leads to the proof of a conjecture of Herzog and Hibi on possible depth functions of ideals.