



Relative error vs coefficient degree for the  $64 \times 64$  Frank matrix. The matrix and target precisions are both `std::float64`. A **single run of La Budde's method** has relative errors of  $10^{166}$  due to a condition number of  $63! = 10^{89}$ , but the characteristic polynomial was **resolved** at 1088 bits. **Conjugations of the Frank matrix** are not resolved at multiprecision because of ill conditioning (the amplification the matrix roundoff error for the constant coefficient is  $63! = 10^{89}$ ).