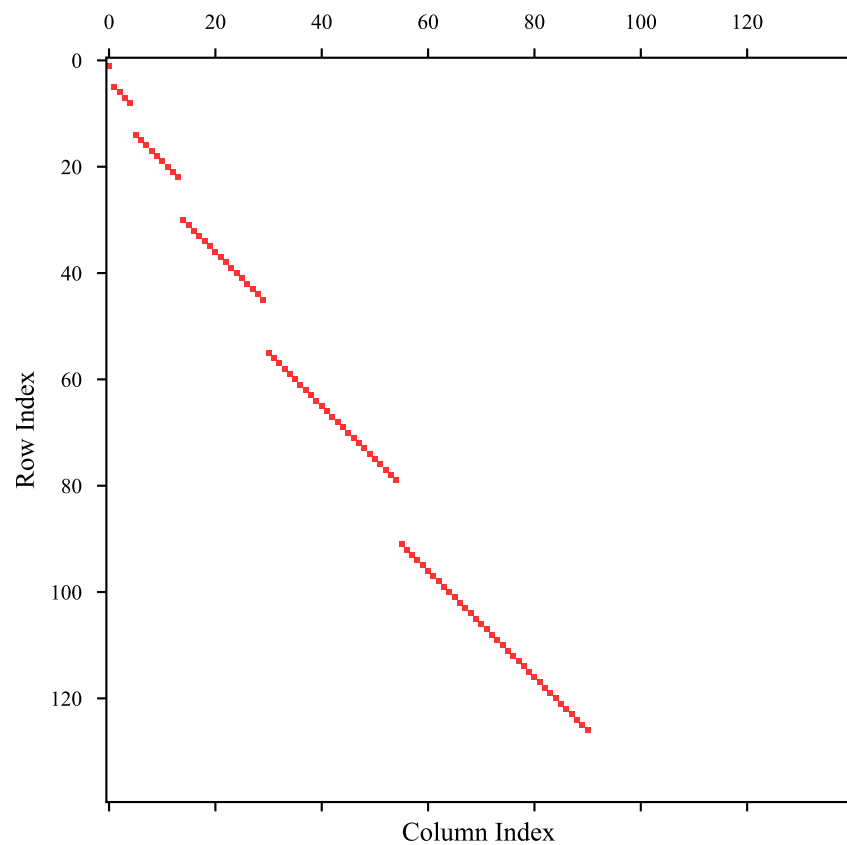


Sparse Matrix Structure: Computational Efficiency of the Lattice

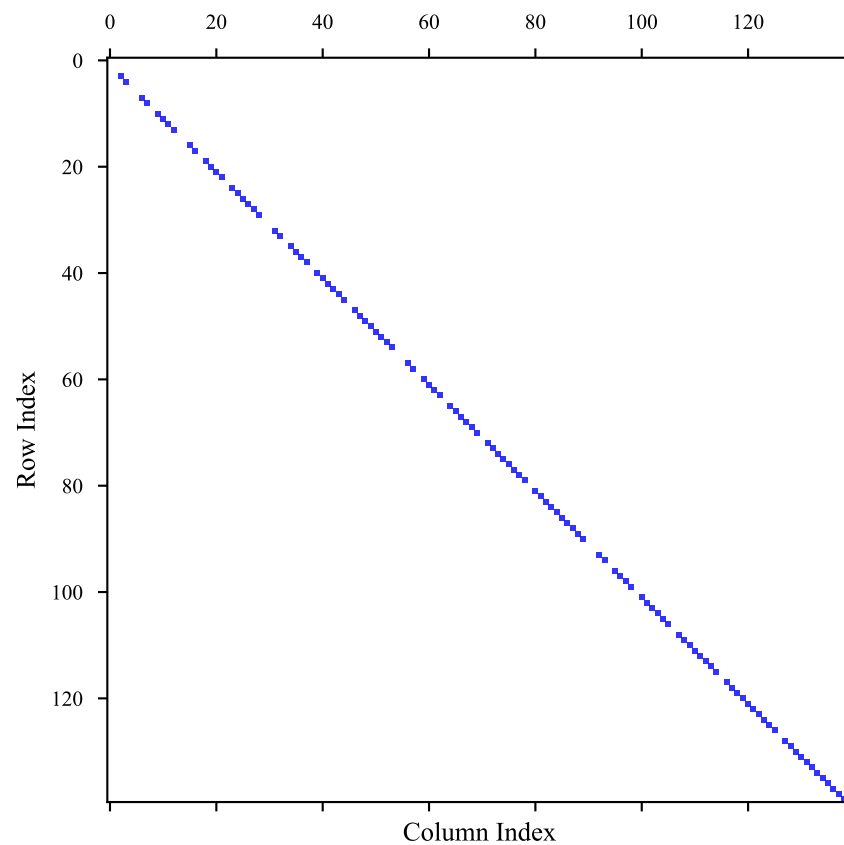
T_+ (Radial Raising Operator)

91 non-zero / $140^2 = 0.46\%$



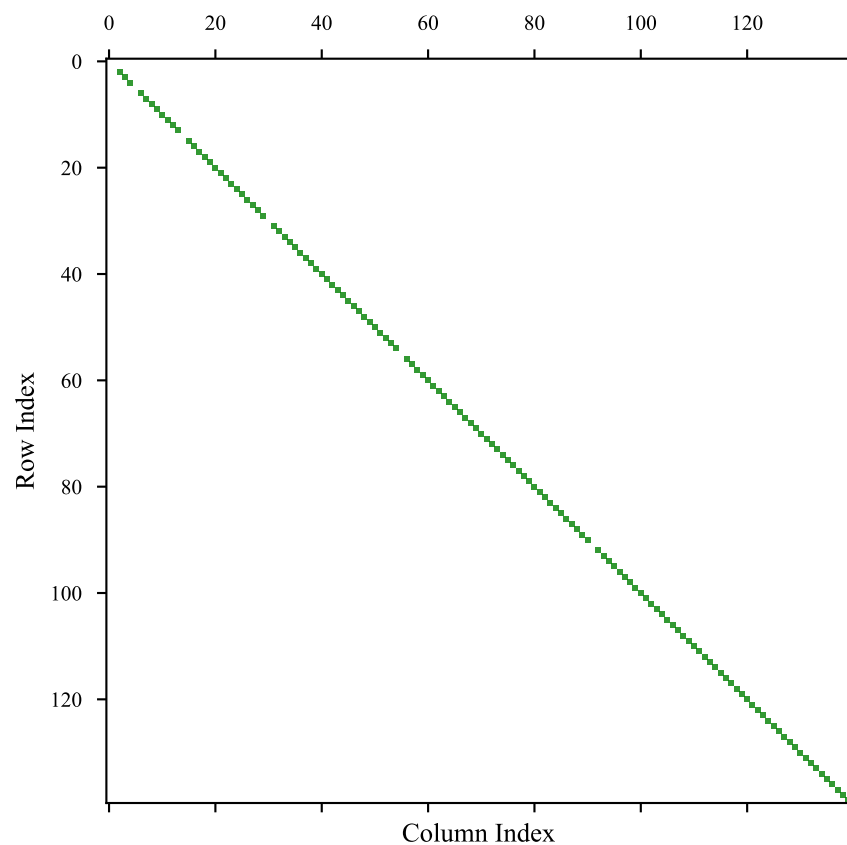
L_+ (Angular Raising Operator)

112 non-zero / $140^2 = 0.57\%$



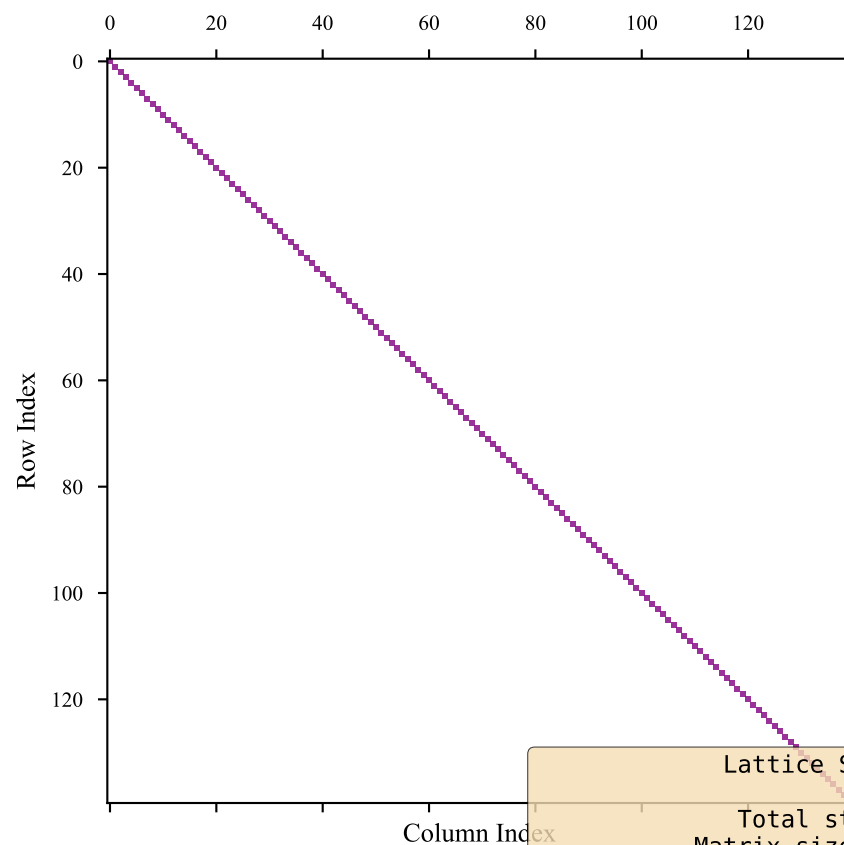
L^2 (Angular Momentum Casimir)

133 non-zero / $140^2 = 0.68\%$



$H_{\text{approx}} = T_3 + 0.1L^2$

140 non-zero / $140^2 = 0.71\%$



Lattice Statistics:
max_n = 7
Total states = 140
Matrix size = 140x140
Dense elements = 19,600
Sparse storage = ~203 elements
Compression = 99.0%