iii) $A^2 = -1 \quad [H, A]$

The matrix elements of $H$ can be organized in selfdual quaternions

$$h_{\pm} = a \pm i b \pm c \pm d$$

Pascalspin

Gaussian - symplectic ensemble

$GUE$

Applications $GUE$; broken time reversal

Givens; system of

Mathematically simplest

Charged particles in an

External magnetic field

$GUE$: time reversal invariant

Nuclear physics

Systems; normal quantum systems

$GSE$: Spin $\frac{1}{2}$; no rotational

Symmetry

$A = i S \cdot K$