

## 4. DIFFUSE SCATTERING AND RELATED TOPICS

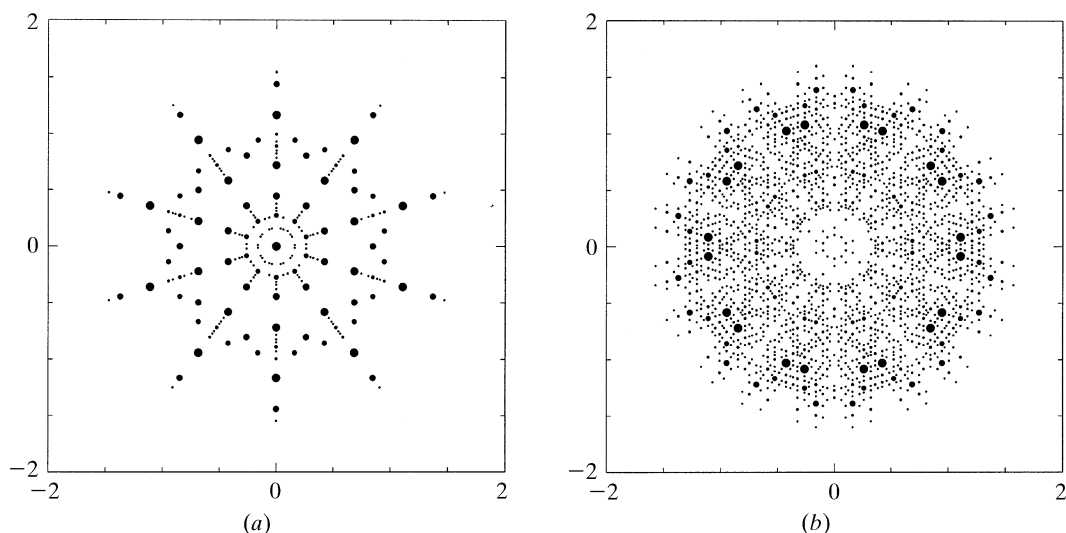


Fig. 4.6.3.36. Parallel-space distribution of (a) positive and (b) negative structure factors of the 3D Penrose tiling of the 6D  $P$  lattice type decorated with point atoms (edge lengths of the Penrose unit rhombohedra  $a_r = 5.0 \text{ \AA}$ ). The magnitudes of the structure factors are indicated by the diameters of the filled circles. All reflections are shown within  $10^{-4}|F(\mathbf{0})|^2 < |F(\mathbf{H})|^2 < |F(\mathbf{0})|^2$  and  $-6 \leq h_i \leq 6, i = 1, \dots, 6$ .

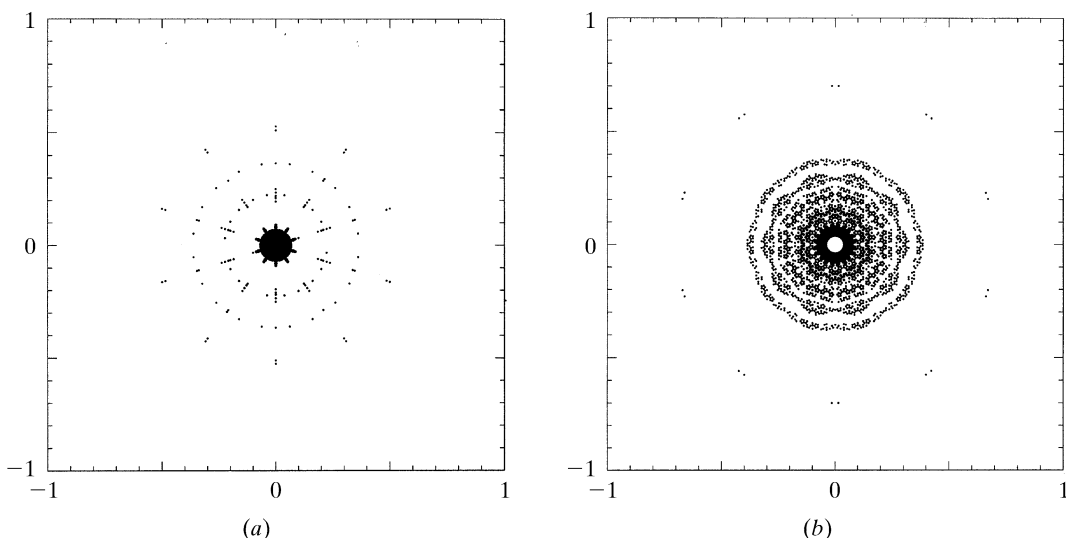


Fig. 4.6.3.37. Perpendicular-space distribution of (a) positive and (b) negative structure factors of the 3D Penrose tiling of the 6D  $P$  lattice type decorated with point atoms (edge lengths of the Penrose unit rhombohedra  $a_r = 5.0 \text{ \AA}$ ). The magnitudes of the structure factors are indicated by the diameters of the filled circles. All reflections are shown within  $10^{-4}|F(\mathbf{0})|^2 < |F(\mathbf{H})|^2 < |F(\mathbf{0})|^2$  and  $-6 \leq h_i \leq 6, i = 1, \dots, 6$ .

Table 4.6.4.1. Intensity statistics of the Fibonacci chain for a total of 161 322 reflections with  $-1000 \leq h_i \leq 1000$  and  $0 \leq \sin \theta / \lambda \leq 2 \text{ \AA}^{-1}$

In the upper line, the number of reflections in the respective interval is given; in the lower line the partial sums  $\sum I(\mathbf{H})$  of the intensities  $I(\mathbf{H})$  are given as a percentage of the total diffracted intensity. The  $F(00)$  reflection is not included in the sums.

	$F(\mathbf{H})/F(\mathbf{H})_{\max} \geq 0.1$	$0.1 > F(\mathbf{H})/F(\mathbf{H})_{\max} \geq 0.01$	$0.01 > F(\mathbf{H})/F(\mathbf{H})_{\max} \geq 0.001$	$F(\mathbf{H})/F(\mathbf{H})_{\max} < 0.001$
$0 \leq \sin \theta / \lambda \leq 0.2 \text{ \AA}^{-1}$	17	148	1505	14 511
$\sum I(\mathbf{H})$	52.53%	2.56%	0.27%	0.03%
$0.2 \leq \sin \theta / \lambda \leq 0.4 \text{ \AA}^{-1}$	11	107	1066	14 998
$\sum I(\mathbf{H})$	27.03%	2.03%	0.19%	0.02%
$0.4 \leq \sin \theta / \lambda \leq 0.6 \text{ \AA}^{-1}$	9	64	654	15 456
$\sum I(\mathbf{H})$	9.84%	0.96%	0.12%	0.01%
$0.6 \leq \sin \theta / \lambda \leq 0.8 \text{ \AA}^{-1}$	6	27	326	15 823
$\sum I(\mathbf{H})$	2.94%	0.34%	0.07%	0.01%
$0.8 \leq \sin \theta / \lambda \leq 2 \text{ \AA}^{-1}$	1	35	338	96 720
$\sum I(\mathbf{H})$	0.23%	0.79%	0.06%	0.01%
Total sum	44	381	3389	157 508
	92.57%	6.67%	0.70%	0.06%