a^* gives the length of the four reciprocal parallel space basis vectors which allow for indexing the diffraction pattern with integers. The 4D hyperrhombohedral for the atomic surfaces with $p = 1, 4$ and $p = 2, 3$, respectively. Their orientations can be obtained from Fig. 2(a). The 4D structure is centrosymmetric.

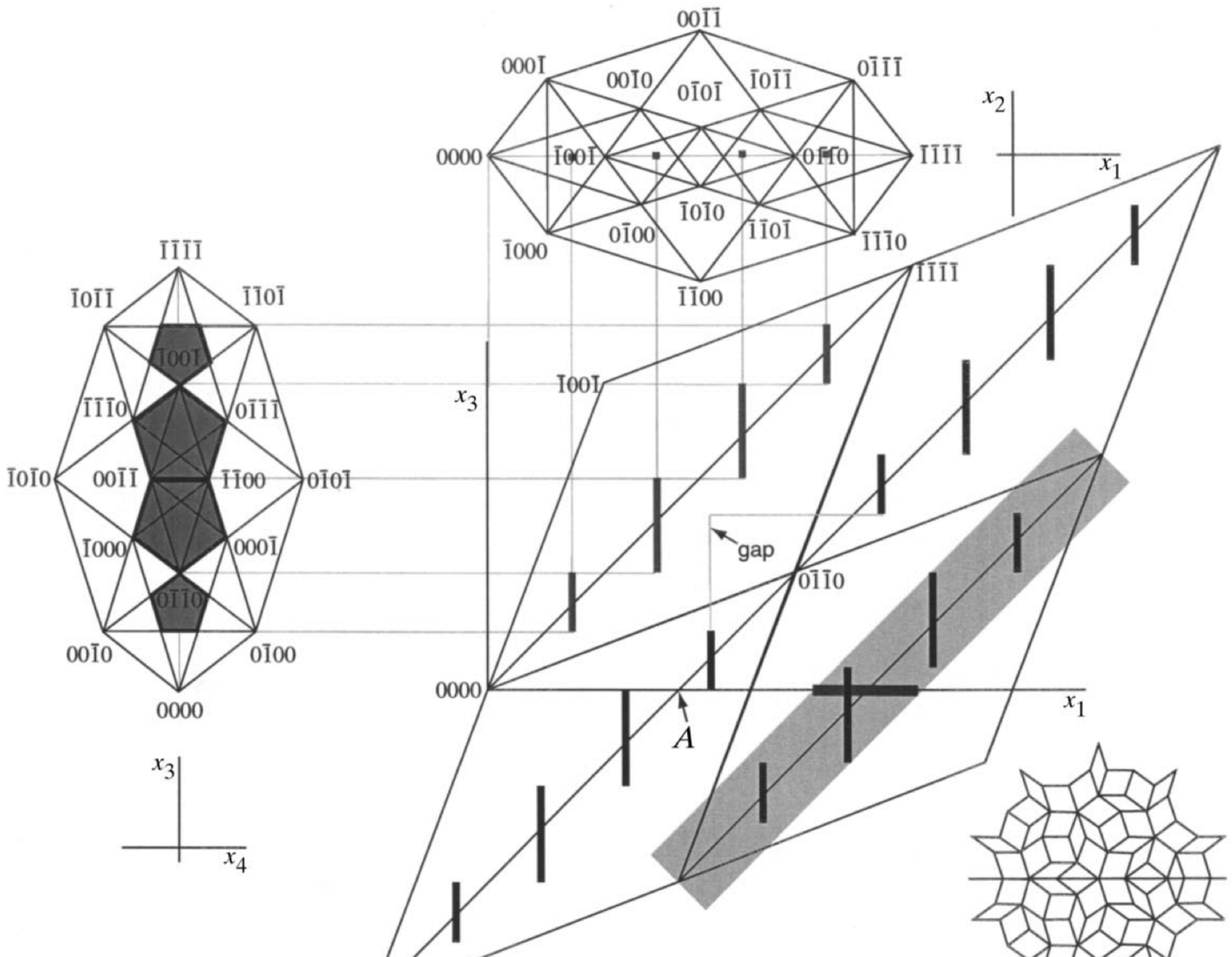

Fig. 2. (a) $(1\,0\,1\,0)_V$ section of the Penrose tiling in the 4D description. The projections of one 4D unit cell onto parallel space $(1\,1\,0\,0)_V$ and perpendicular space $(0\,0\,1\,1)_V$ are also shown. The atomic surfaces [line elements in the $(1\,0\,1\,0)_V$ section] projected upon $\mathbf{V}^{\perp}$ appear as regular pentagons. Upon $\mathbf{V}^{\parallel}$, they are projected to points. The direction of the oblique projection is marked by a