the real pilot. Thus, \( a_k \) is the real data around the real pilot at position \( k \) and \( \gamma_k \) is the value of \( \langle g \rangle_{m_0, n_0}^{m_0+p, n_0+q} \) at position \( k \). Fig. 5 gives an illustration of this notation. Then, we can write:

\[
a^{(i)}_{m_0, n_0} = \sum_{(p,q)\in \Omega_{i,1}} a_{m_0+p, n_0+q} \langle g \rangle_{m_0, n_0}^{m_0+p, n_0+q} = \sum_{k=0}^{7} a_k \gamma_k. \tag{13}
\]

Ideally, one would like to transmit eight random real data \( d_k \) at the eight distinct positions, \( k = 0, 1...7 \), and to get \( a^{(i)}_{m_0, n_0} = 0 \). That is naturally not possible in general.

**Method 1:**

The first idea is to transmit seven data at seven positions \( i_0, i_1, i_2, i_3, i_4, i_5, i_6 \) i.e. \( a_{i_k} = d_k \) with \( k \in [0, 6] \). At position \( i_7 \) we transmit the value that will cancel \( a^{(i)}_{m_0, n_0} \) i.e.

\[
a_{i_7} = -\sum_{k=0}^{6} \frac{a_{i_k} \gamma_{i_k}}{\gamma_{i_7}}, \tag{14}
\]

then \( a_{i_7} \) is not really a data. Indeed, this method enables the estimation of the channel at \( (m_0, n_0) \) position. However, the major problem with this method is the overall power used to estimate the channel. This power is actually the power transmitted in \( p_{m_0, n_0} \) plus that used to transmit the signal corresponding to the \( i_7 \) position. Based on (14), the power of