frame.m ← main code

codage.m
– G_def.m

$g_i(l) = x_s(l)\, x_s(l-i)$, $l = 0, \cdots, SOF-1$
$h_i(l) = x_p(l)\, x_p(l-i)$, $l = 0, \cdots, PLSC-1$
} $i = 1, 2, 4, 8, 16, 32$

$x_s \rightarrow$ mapped SOF symbols, $x_p \rightarrow$ scrambled PLSC symbols

without PL headers

channel.m $\Rightarrow$ $Y_k = X_k e^{j(2\pi \Delta f k M + \phi_k)} + V_k$, $k = 1, \cdots, N$
(V_k: noise)

$y = \frac{Y_k}{|Y_k|}$

detec_sof_plsc_glold.m → Global summation of SOF/PLS detection

$$dn_1(k) = m_i(k) = \sum_{l=0}^{PLSC-1} e^{j(\theta(k-l) - \theta(k-l-i))} \cdot h_i(l)$$

$$dn_2(k) = n_i(k) = \sum_{l=0}^{SOF-1} e^{j(\theta(k-l) - \theta(k-l-i))} \cdot g_i(l)$$

$k = 1, \cdots, N$

~~$d_i(k)$~~ $= P_i(k) = \max\left(|n_i(k-PLSC) + m_i(k)|, |n_i(k-PLSC) - m_i(k)| \right)$, for $k > PLSC$

without PL headers $= d = \sum_{i>1} P_i(k)$, $i = 1, 2, 4, 8, 16, 32$

with PL headers

with PL headers $\Rightarrow$ same as previous case by adding PLS

T = threshold $= \frac{maxi}{99} * (i-1)$, $maxi = \max$ (with PL headers, without PL headers)

$P_{FA} = \frac{\sum sign(|\text{without PL headers}| - T)}{N}$

$P_{MD} = \sum sign(T - |\text{with PL headers}|) \,/\, (N + PLSC + SOF)$