$$= (-1)^0 \dim P^{0,0} + (-1)^1 \dim P^{1,1} + \cdots + \cdots\cdots + (-1)^n \dim P^{n,n}$$

$$+ (-1)^0 \dim P^{0,2} + (-1)^1 \dim P^{1,3} + (-1)^2 \dim P^{2,4} + \cdots + (-1)^{n-1} \dim P^{n-1,n+1}$$

$$+ (-1)^0 \dim P^{0,4} + (-1)^1 \dim P^{1,5} + \cdots + (-1)^{n-2} \dim P^{n-2,n+2}$$

$$\ddots \qquad /$$

$$(-1)^0 \dim P^{0,2n}$$

$$= \sum_{i=0}^{n} (-1)^i \dim P^{i,i+0} + \sum_{i=0}^{n-1} (-1)^i \dim P^{i,i+2}$$

$$+ \sum_{i=0}^{n-2} (-1)^i \dim P^{i,i+4} + \sum_{i=0}^{n-3} (-1)^i \dim P^{i,i+6} + \cdots + \sum_{i=0}^{0} (-1)^i \dim P^{i,i+2n}$$

$\Rightarrow$ By the previous identity.

$$\sum_{i=0}^{p} (-1)^i \dim P^{i,i+j} = (-1)^p h^{p,p+j} + 2 \sum_{i=0}^{p-1} (-1)^i h^{i,i+j},$$

$$\sum_{i=0}^{n} (-1)^i \dim P^{i,i+0} = (-1)^n h^{n,n} + 2 \sum_{i=0}^{n-1} (-1)^i h^{i,i+0}$$

$$\sum_{i=0}^{n-1} (-1)^i \dim P^{i,i+2} = (-1)^{n-1} h^{n-1,n-1+2} + 2 \sum_{i=0}^{n-2} (-1)^i h^{i,i+2}$$

$$\sum_{i=0}^{n-2} (-1)^i \dim P^{i,i+4} = (-1)^{n-2} h^{n-2,n-2+4} + 2 \sum_{i=0}^{n-3} (-1)^i h^{i,i+4}$$

$$\sum_{i=0}^{n-3} (-1)^i \dim P^{i,i+6} = (-1)^{n-3} h^{n-3,n+3} + 2 \sum_{i=0}^{n-4} (-1)^i h^{i,i+6}$$

$$\vdots$$

$$+ \quad \sum_{i=0}^{0} (-1)^i \dim P^{i,i+2n} = (-1)^0 h^{0,2n}.$$

$\Rightarrow$ LHS $= I(M)$

$$\text{RHS} = \sum_{\substack{p+q=2n \\ p\le q}} (-1)^p h^{p,q} + 2 \sum_{\substack{2i+j \equiv 0(2) \\ i\ge 0}}^{\le 2n-2} (-1)^i h^{i,i+j}$$

$$\qquad\qquad \| $$

$$2 \sum_{\substack{p+q\equiv 0 \\ p+q<2n}} (-1)^p h^{p,q}$$