The Prizm Construction

June-17-10 4:24 PM

$f_i = (e_i, 0) \quad g_i = (e_i, 1)$

$$\partial\sigma = \sum_{i=0}^{n} (-)^i \sigma \circ [e_0 \, \hat{e}_i \, e_n] \qquad P\sigma = \sum_{j=0}^{n} (-)^j h \circ (\sigma \times I) \circ [f_0 .. f_j g_j .. g_n]$$

$$\partial P\sigma = \partial \left[\sum_{j=0}^{n} (-)^j h \circ (\sigma \times I) \circ [f_0 .. f_j g_j .. g_n] \right]$$

$$= \sum_{j=0}^{n} \sum_{i=0}^{n+1} (-)^{i+j} h \circ (\sigma \times I) \circ [f_0 \ldots f_j g_j \ldots g_n] \circ [e_0 \, \hat{e}_i \, e_{n+1}]$$

$$= \sum_{j=0}^{n} \Bigg(\sum_{i<j} (-)^{i+j} h \circ (\sigma \times I) \circ [f_0 . \hat{f}_i \, f_j g_j \ldots g_n] \Bigg\} t_1$$

$$+ \sum_{j<i\leq n} (-)^{i+j+1} h \circ (\sigma \times I) \circ [f_0 .. f_j \, g_j \, \hat{g}_i .. g_n] \Big\} t_2$$

$$+ h \circ (\sigma \times I) \circ [f_0 \ldots f_{j-1} g_j \ldots g_n] \Big\} t_3$$

$$- h \circ (\sigma \times I) \circ [f_0 \ldots f_j, g_{j+1} \ldots g_n] \Bigg) \Big\} t_4$$

$$P\partial\sigma = P \left(\sum_{i=0}^{n} (-)^i \sigma \circ [e_0 \ldots \hat{e}_i \ldots e_n] \right)$$

$$= \sum_{i=0}^{n} \sum_{j=0}^{n-1} (-)^{i+j} h \circ \big((\sigma \circ [e_0 \ldots \hat{e}_i \ldots e_n]) \times I \big) \circ [f_0 \ldots f_j g_j \ldots g_{n-1}]$$

$$= \sum_{i=0}^{n} \Bigg(\sum_{i<j} (-)^{i+j} [f_0 \ldots \hat{f}_i \ldots f_{j+1} \, g_{j+1} \ldots g_n] \Bigg\} t_5$$

$$+ \sum_{j<i} (-)^{i+j} [f_0 \ldots f_j g_j \ldots \hat{g}_i \ldots g_n] \Bigg) \Big\} t_6$$

It is easy to see that $t_1 + t_5 = 0$, $t_2 + t_6 = 0$, so

$$\partial P\sigma + P\partial\sigma = t_3 + t_4 = g_*\sigma - f_*\sigma$$