(By the results of section 2 this will occur if everything is complex analytic and the dimensions are correct.)

⌈ See P 386. example 1. ⌋

In this case, we can give the smooth locus $D_i - D_{i-1}$ an orientation: In a nbd of a point $x_0 \in D_i - D_{i-1}$, complete the sections $e_1 = \sigma_1, \ldots, e_{i-1} = \sigma_{i-1}$ to a frame for E, and write

$$\sigma_i(x) = \sum_j f_j(x) \cdot e_j(x).$$

D_i is then given near x_0 as the locus $(f_i = \cdots = f_k = 0)$; let Φ_i be the orientation on D_i near x_0 such that the form

$$\Phi_i \wedge \frac{\sqrt{-1}}{2}(df_i \wedge d\bar{f}_i) \wedge \cdots \wedge \frac{\sqrt{-1}}{2}(df_k \wedge d\bar{f}_k)$$

is positive for the given orientation on M.

⌈ $\sigma_i(x) = f_1(x)\,\sigma_1(x) + \cdots + f_{i-1}(x)\,\sigma_{i-1}(x) + f_i(x)\overset{e_i}{(x)} + \cdots + f_k(x)\overset{e_k}{(x)}$

If $x \in D_i$, then $\sigma_i(x) = f_1(x)\overset{\sigma_1(x)}{\vphantom{x}} + \cdots + f_{i-1}(x)\,\sigma_{i-1}(x)$ in the nbd of x_0. $\Rightarrow$ $f_i(x) = \cdots = f_k(x) = 0$ ⌋

By the theorem on smoothing of cohomology given in Section 1 of this chapter, the locus D_i together with the orientation Φ_i on $D_i - D_{i-1}$ represents a cycle in homology, called the degeneracy cycle of the sections σ.

⌈ $T(\varphi) = \int_{D_i - D_{i-1}} \varphi$ is well-defined since $D_i - D_{i-1}$ is oriented (Φ_i) and the integration