

For $p=1$ we may obtain a clear picture of what the residues look like. Let D be an irreducible divisor and $x_0 \in D$ a simple point. Simple point means smooth point, see P44. Whitney

The boundary γ_0 of a normal disc to D in M at x_0 is then a 1-cycle in $H_1(M-D, \mathbb{Z})$ that bounds in M , and the class of γ_0 is independent of x_0 , since the smooth points of D form a connected manifold (Fig. 4).

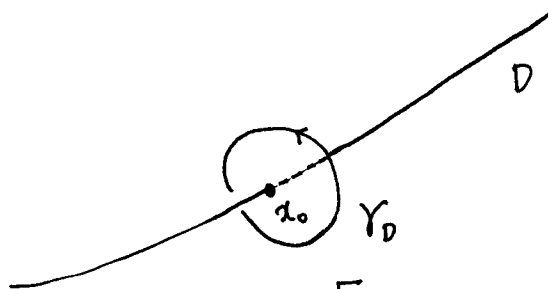


Figure 4

If y_0 is another simple point of D , since D^* is connected (\Rightarrow path-connected) by P21 ($\because D$ is irreducible), \exists a path α s.t. $\alpha(0) = x_0$, $\alpha(1) = y_0$.

$\Rightarrow \exists$ a tube σ s.t. $\partial\sigma = \gamma_{D,x_0} - \gamma_{D,y_0}$.

$\Rightarrow [\gamma_{D,x_0}] = [\gamma_{D,y_0}] \Rightarrow$ The class of γ_0 is independent of x_0 .

Now suppose that $D = D_1 + \dots + D_k$ is a divisor with irreducible components D_i . We may choose the γ_{D_i} to lie in $U = M - D$, and we claim that any circle γ in

$$\ker \{ H_1(U, \mathbb{Z}) \longrightarrow H_1(M, \mathbb{Z}) \}$$

is homologous to a linear combination of the γ_{D_i} .

If Since $M - D$ is open & dense in M , and M is