Consider $f_t(x,y) = (\overset{f_{1t}}{\overset{\shortparallel}{(x+t)y}},\ \overset{f_{2t}}{\overset{\shortparallel}{(x-y-t)(x-\gamma(y+t))}})$.

$\Rightarrow$ Since $f_t(0,0) = (0,\ t^2\gamma)$, and

$f_0 \neq 0$ on $\{\, |xy| = \epsilon,\ |(x-y)(x-\gamma y)| = \epsilon \,\}$, ϵ sufficiently small, for $|t| < \delta$, δ sufficiently small,

$|f_t| \neq 0$ on $\{\, |xy| = \epsilon,\ |(x-y)(x-\gamma y)| = \epsilon \,\}$, see P657.

$\Rightarrow$ By the principle of continuity on P657,

$$\lim_{t\to 0} \sum_{P_t \in f_t^{-1}(0)} \mathrm{Res}_{P_t}\left(\frac{df_{1t}}{f_{1t}} \wedge \frac{df_{2t}}{f_{2t}}\right) = \int_{\substack{|xy|=\epsilon \\ |(x-y)(x-\gamma y)|=\epsilon}} \frac{dxy}{xy} \wedge \frac{d(x-y)(x-\gamma y)}{(x-y)(x-\gamma y)}$$

$$f_t^{-1}(0) = \left\{ (-t,-2t),\ \left(-t,\ -\frac{t(1+\gamma)}{\gamma}\right),\ (t,0),\ (\gamma t, 0) \right\}$$

$$J(f_t) = \begin{vmatrix} y, & x+t \\ 2x-(1+\gamma)y-(1+\gamma)t, & -(1+\gamma)x + 2\gamma y + (\gamma+\gamma)t \end{vmatrix}$$

$$= -(1+\gamma)xy + 2\gamma y^2 + (\gamma+\gamma)ty - 2x^2 - 2xt + (1+\gamma)y(x+t) + (1+\gamma)t(x+t)$$

$$= 2\gamma y^2 + (\gamma+\gamma)ty - 2x(x+t) + (1+\gamma)yt + (1+\gamma)t(x+t)$$

$$= 2\gamma y^2 + (\gamma+\gamma)ty + (1+\gamma)t(x+t) - 2x(x+t) + (1+\gamma)yt$$

At $(t,0)$,

$$J(f_t) = 2t^2(1+\gamma) - 3t^2 = t^2(2\gamma-1)$$

At $(\gamma t, 0)$,

$$J(f_t) = t^2(1+\gamma)^2 - 2\gamma t^2(1+\gamma) = t^2(1+\gamma)(1+\gamma-2\gamma)$$
$$= t^2(1+\gamma)(1-\gamma)$$

At $(-t,-2t)$, $J(f_t) = 2t^2(\gamma-1)$

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