Flow/dissipation/generation of a meromorphic 1-form

Let

$$\omega$$

be a meromorphic 1-form.

local solutions	**flow**	**generation**	**dissipation**
$$f(z) = \int_{\overline{Oz}} \omega$$ **near** z_0; $$\begin{aligned} \mathrm{d}u + i\mathrm{d}v &= \mathrm{d}f \\ &= \omega \\ &= \omega_z \mathrm{d}z \\ &= (\Re(\omega_z) + i \\ &= (\Re(\omega_z)\mathrm{d}x \end{aligned}$$			
$F := \Re(\omega) = \Re(\omega_z)\mathrm{d}x$	"*irrotational, incompressible and steady* fluid flow" of $$F$$ (not well-defined)	field $$F$$	*steady* heat flow $$F$$ with sources
$u := \Re(f)$	*velocity potential*	*charge potential*	*temperature*
$\mathrm{d}u = F$		$\mathrm{d}F = \text{sources}$	$\Delta u = \cancel{\frac{\partial u}{\partial t}} + \text{sources}$
level sets of $$u = \Re(f)$$	*equipotential* contour	*equipotential* contour	*equitemperature* contour
$*\mathrm{d}v = F$	F is the "Hamiltonian vector field of v" (not well-defined)		
level sets of $$v := \Im(f)$$	*flow lines*	*field lines*	*heat flow lines*
f, ω defined at p	regular point		
$A_k(z - z_0)^k$ for $k > 1$	**fixed** point of order $k > 1$	field is zero till $k-1$-th order	
$A_1(z - z_0)$	**regular** zero	potential is zero but field is has non-zero	
$A \log(z - z_0), A > 0$ whose $\Re$-part is $A \log \lvert z - z_0 \rvert$	**source**	(positively charged) **monopole** of charge A	
$A \log(z - z_0), A < 0$ whose $\Re$-part is $A \log \lvert z - z_0 \rvert$	**sink**	(negatively charged) **monopole** of charge A	
$A \log(z - z_0), A \in i\mathbb{R}$ whose $\Re$-part is $A\theta$ (not well-defined)	**vortex**	**electromotive generator** of flux A	
$\frac{A_1}{z - z_0}$ whose $\Re$-part is	**pole** of order 1	**dipole** of moment A_1	
$\frac{A_2}{(z - z_0)^2}$	**pole** of order 2	**quadrupole**	
$\frac{A_k}{(z - z_0)^k}$	**pole** of order k	**charged** 2^k**-pole**	

$$\frac{A}{z - z_0} = (a + ib)\frac{x - iy - (x_0 + iy_0)}{(x - x_0)^2 + (y - y_0)^2} = \frac{ax + by}{x^2 + y^2} + i(\dots)$$

Current note has 0 direct children and 0 total descendants.

- stem
  - Objects stemming from $\mathbb{R}$-spaces of dimension 2
    - Riemann surfaces
      - Fluid

And it has 16 siblings.

- stem

- Objects stemming from $\mathbb{R}$-spaces of dimension 2
    - Riemann surfaces
        - Vector bundles on complex 1-manifolds
        - Classification of complex 1-manifold
        - Riemann's existence of holomorphic maps between compact Riemann surfaces
        - Divisors on compact Riemann surfaces
        - Fluid
        - Meromorphic differentials on Riemann surfaces
        - Holomorphic functions on a complex 1-manifold
        - Holomorphic maps of type $0 \xrightarrow{3} 0$
        - Rational maps
        - Hurwitz scheme
        - Moduli space of $\mathbb{C}$-manifolds
        - Meromorphic functions on a Riemann surface
        - Normalization of plane projective $\mathbb{C}$-curves and Riemann surfaces
        - Riemann surfaces defined over a number field
        - Hyperelliptic Riemann surfaces
        - Riemann surfaces with a holomorphic 1-form