On the right hand side, approximating $x(t+1)$ and $y(t+1)$ by $x(t)$ and $y(t)$.

$$x(t+1) = \frac{\xi}{1+\xi} x(t) + \frac{1}{1+\xi} \phi(x(t), y(t))$$

$$y(t+1) = \frac{\omega}{1+\omega} y(t) + \frac{1}{1+\omega} \varphi(x(t), y(t))$$

result $\Rightarrow$ for any $\forall\, \omega$ and $\xi \geq \omega^*, \xi^*$, x and y converges to x^* and

I suppose we also can write this as function of time like

~~$\xi(t) =$~~ $\xi(\phi)$ and ~~with~~ $\omega(\varphi)$ perhaps

$$dx(t+1) = \frac{\xi}{1+\xi} dx(t) + \frac{1}{1+\xi}\left(\frac{\partial\varphi}{\partial x_t} dx_t + \frac{\partial\varphi}{\partial y_t} dy_t\right)$$

$$= \frac{1}{1+\xi}\left(\xi + \frac{\partial\varphi}{\partial x_t}\right) dx(t) + \frac{1}{1+\xi}\left(\frac{\partial\varphi}{\partial y_t}\right) dy_t$$

and setting $\xi + \frac{\partial\varphi}{\partial x_t} = 0$ or $\xi(t) = -\phi'$

and the same for $\omega(t) = -\varphi'$!?

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