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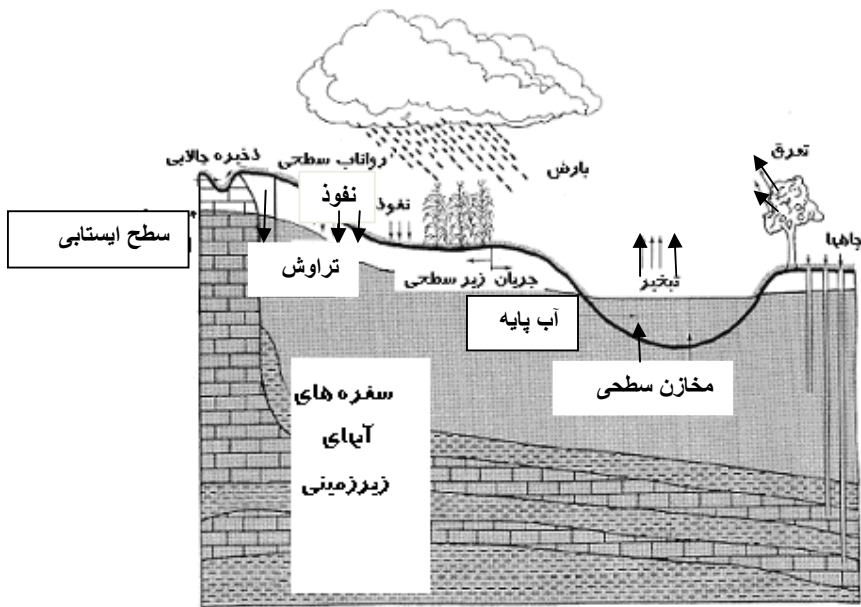
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Archive 01

$r(t)$

$y(t)$

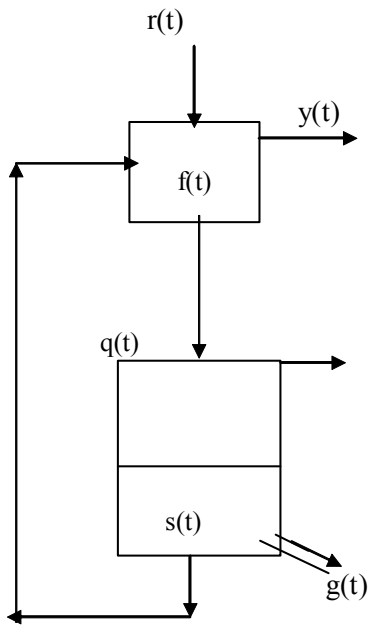
$q(t)$

$q(t)$

$g(t)$

(.)

...



$S_m$

( $S=S_m$ )  
( $f_0$ )

)  $S_m$  :

$f_c$  ( )  $f_0$  ( )  
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( $f_c$ )  
 $S(t)$   
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$$f(t) = f_0 - (f_0 - f_c) S(t) / S_m$$

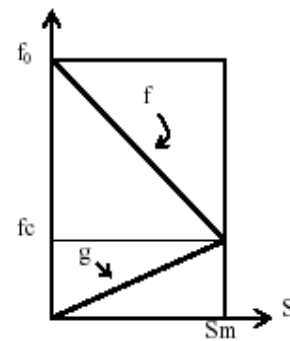
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$g(t)$

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$$g(t) = f_c S(t) / S_m$$

( )



( $f$ )  
( $s$ ) (  $g$  ) (  $s$  )

( $f_0$ )

$$.(q_e+q_b)/2=r \quad (t) \quad S(t)$$

( )

$$S_e=(S_b(1-f_c\Delta t/2S_m)+r\Delta t)/(1+f_c\Delta t/2S_m)$$

$$q(t)-g(t)=ds/dt \quad ( )$$

$$.r < f_b \quad r > f_e$$

$\Delta t$

$(f_0 \ f_c \ S_m)$

$S_r$

$f(t) \ g(t)$

$$r=f(t)$$

$$(\Delta t=t_{j+1}-t_j)$$

$$S_r=(f_0-r)S_m/(f_0-f_c) \quad ( )$$

$$\Delta t=\Delta t_1 \quad S_e=S_r$$

$$S_e-S_b=(q_b-q_e)\Delta t/2-(g_b-g_e)\Delta t/2 \quad ( )$$

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$$\Delta t_1=(S_r-S_b)/(r-(S_b+S_t)f_c/2S_m) \quad (0 < \Delta t_1 < \Delta t)$$

$\Delta t$

$e \ b$

(q)

$S_e$

:

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$$q_e=f_e$$

$$r > f_b \quad r > r_a$$

$$S_e=(f_0\Delta t_2+S_r(1-f_0\Delta t_2/2S_m))/(1+f_0\Delta t_2/2S_m)$$

$$.q_b=f_b$$

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$$S_e=(f_0\Delta t+S_b(1-f_0\Delta t/2S_m))/(1+f_0\Delta t/2S_m)$$

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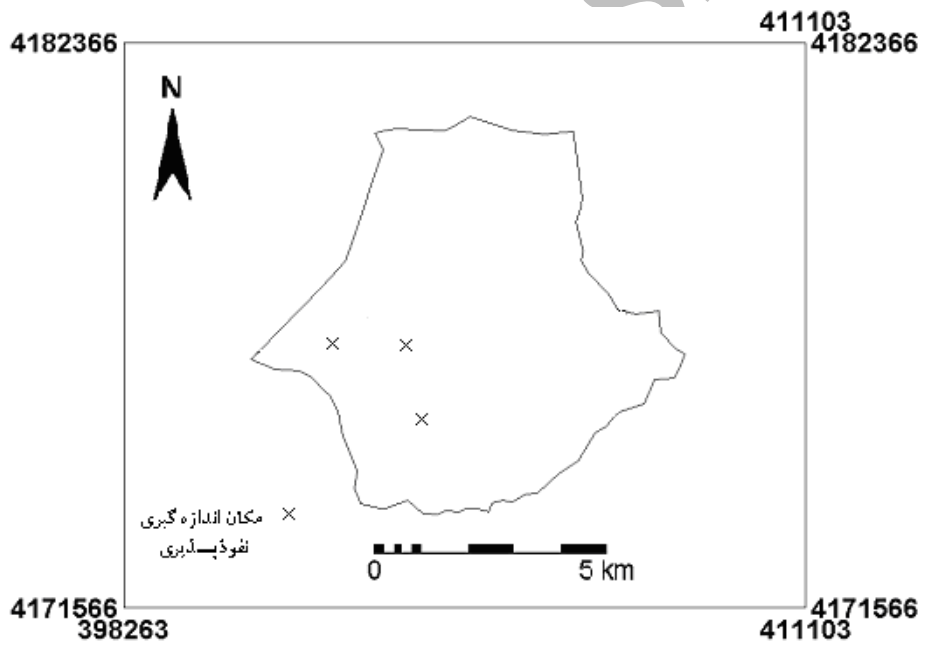
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$$r < f_e \quad r < f_b$$

SID



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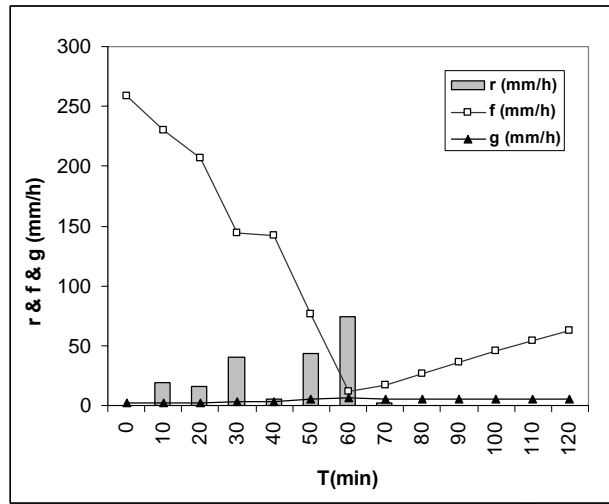
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$f_0$

$f_c$



...



(f<sub>c</sub>)

(f<sub>0</sub> f<sub>c</sub>)

(f<sub>c</sub>)

(S<sub>m</sub>)

f(t)

(S<sub>m</sub>)

(f<sub>c</sub>)

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## Determination of percolation during a rainfall storm (Case study: Kechik catchment, Golestan province)

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### Abstract

Understanding the processes involved in infiltration and percolation in soils is one of the important factors in evaluating the generation of runoff, the supply of soil water and the potential for recharge. Percolation is the process of entry moisture from the upper soil layer to lower layers. The rate of percolation depends on the type of soils at the location considered and on the moisture content of the upper soil layer. For a given location, this rate is a function of the actual infiltration rate and the moisture content of the upper soil layer. In this research three parameters of the maximum soil moisture content, maximum and minimum infiltration capacity rate as inputs are used to calculate variation of soil moisture, and infiltration rate during a rainfall event. Numerical results show the effects of surface flow, storm rainfall intensity and soil moisture variability on the percolation rate in ten minutes time interval in Kechik catchment of Golestan province, Iran.

**Keywords:** Percolation rate, Moisture content, Upper soil layer, Infiltration varieties, Maximum and minimum infiltration capacity rate.

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