

```

vk = 0.84; (*Œí á÷í àÿ æŒí Œí æòü*)
a = 0.; (*óæŒí Œáí Łá*)
e = 10-6; (*í î ªŒáí í æòü*)
t0 = 15; (*âŒàí ŷ Œàçªí í à*)

s[t_] := vk t; (*Œí î ŒäŁí àòà î ò âŒàí áí Ł*)
v[t_] := vk; (*æŒí Œí æòü î ò âŒàí áí Ł*)
w[t_] := 0; (*óæŒí Œáí Łá*)

tzap[x_, y_, t_] := Module[{t1, t2},
  t1 = t; t2 = t - 2 e;
  While[Abs[t1 - t2] > e, t1 = t2; t2 = t -  $\sqrt{(x - s[t1])^2 + y^2}$ ];
  (*Œàæ÷âò ŁòâŒàòŁŷì Ł çãĩ àçäŒââðøáªí î î í áí òà*)
  t2
]; (*tzap*)

klw[x_, y_, t_] := Module[{t2, r, nx, k},
  t2 = tzap[x, y, t]; (*Œàæ÷âò ŁòâŒàòŁŷì Ł çãĩ àçäŒââðøáªí î î í áí òà*)
  r = t - t2; nx = (x - s[t2]) / r; k = 1 - nx v[t2];
  k
]; (*k*)

Rlw[x_, y_, t_] := Module[{t2, r, nx, k},
  t2 = tzap[x, y, t]; (*Œàæ÷âò ŁòâŒàòŁŷì Ł çãĩ àçäŒââðøáªí î î í áí òà*)
  r = t - t2; nx = (x - s[t2]) / r; k = 1 - nx v[t2];
  k * r
]; (*-ââŁóæ ,Łáí àŒà ´ŁáâŒòà*)

phi[x_, y_, t_] := Module[{t2, r, nx, k},
  t2 = tzap[x, y, t]; (*Œàæ÷âò ŁòâŒàòŁŷì Ł çãĩ àçäŒââðøáªí î î í áí òà*)
  r = t - t2; nx = (x - s[t2]) / r; k = 1 - nx v[t2];
   $\frac{1}{k * r}$ 
]; (*phi - æŒà°ŷŒíŒŒ ŷĩ òáí öŁà° ,Łáí àŒà ´ŁáâŒòà*)

electrgradphi[x_, y_, t_] := Module[{t2, r, nx, ny, n, k},
  t2 = tzap[x, y, t]; (*Œàæ÷âò ŁòâŒàòŁŷì Ł çãĩ àçäŒââðøáªí î î í áí òà*)
  r = t - t2; nx = (x - s[t2]) / r; ny = y / r; n = {nx, ny}; k = 1 - nx v[t2];
   $\frac{1}{r^2 k^2} \left( (1 - v[t2]^2 + r nx w[t2]) \frac{n}{k} - \{v[t2], 0\} \right)$ 
]; (*ý°. ŷĩ °â dphi_dt*)

electrgradphiM[x_, y_, t_] := Module[{ee},
  ee = electrgradphi[x, y, t];
   $\sqrt{ee.ee}$ 
]; (*ªªí î î äóü*)

electrAdt[x_, y_, t_] := Module[{t2, r, nx, ny, n, k},
  t2 = tzap[x, y, t]; (*Œàæ÷âò ŁòâŒàòŁŷì Ł çãĩ àçäŒââðøáªí î î í áí òà*)
  r = t - t2; nx = (x - s[t2]) / r; ny = y / r; n = {nx, ny}; k = 1 - nx v[t2];

```

$$\frac{1}{r^2 k^2} \left(\{v[t2], 0\} \left(\frac{1}{k} (v[t2]^2 - r nx w[t2] - 1) + 1 \right) - r \{w[t2], 0\} \right)$$

```

]; (*ý°. ïî °â dA_dt*)

electrdAdtM[x_, y_, t_] := Module[{ee},
  ee = electrdAdt[x, y, t];
  Sqrt[ee.ee]
]; (*âªî ïî äó°ü*)

electr[x_, y_, t_] := Module[{t2, r, nx, ny, n, k},
  t2 = tzap[x, y, t]; (*ðàæ÷âð ÈòàðàðËÿì È çâï àçäââðøâªî ïï áí òà*)
  r = t - t2; nx = (x - s[t2]) / r; ny = y / r; n = {nx, ny}; k = 1 - nx v[t2];
  1/k^3 ( (1 - v[t2]^2 + r nx w[t2]) / r^2 (n - {v[t2], 0}) - k/r {w[t2], 0} )
]; (*ý°. ïî °â*)

electrM[x_, y_, t_] := Module[{ee},
  ee = electr[x, y, t];
  Sqrt[ee.ee]
]; (*âªî ïî äó°ü*)

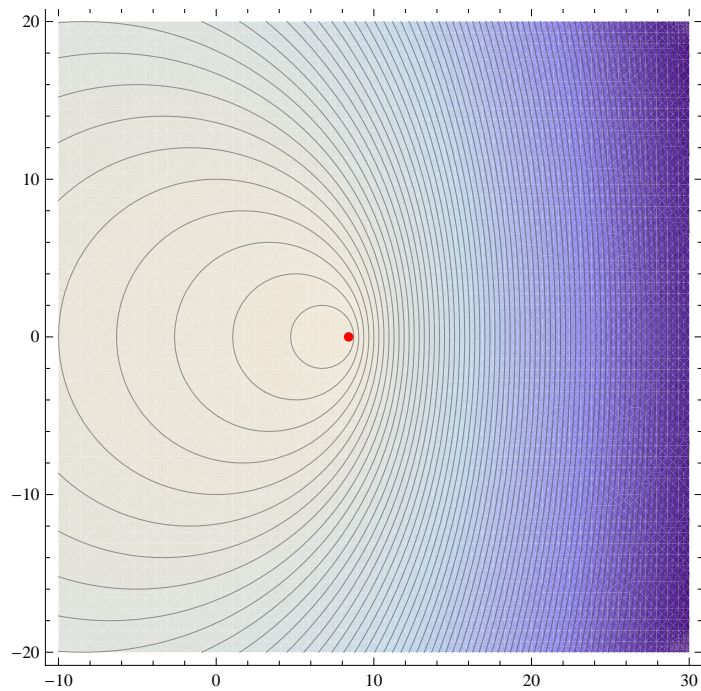
electrMM[x_, y_, t_] := Module[{ee},
  ee = electrgradphi[x, y, t] + electrdAdt[x, y, t];
  Sqrt[ee.ee]
];

electrMPM[x_, y_, t_] := Module[{ee},
  ee = electrgradphi[x, y, t] - electrdAdt[x, y, t];
  Sqrt[ee.ee]
];

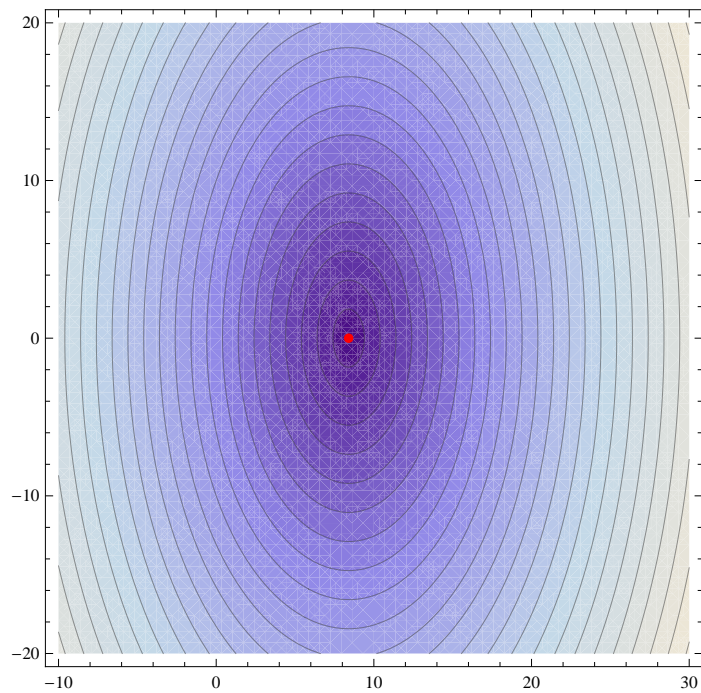
t = 10;

```

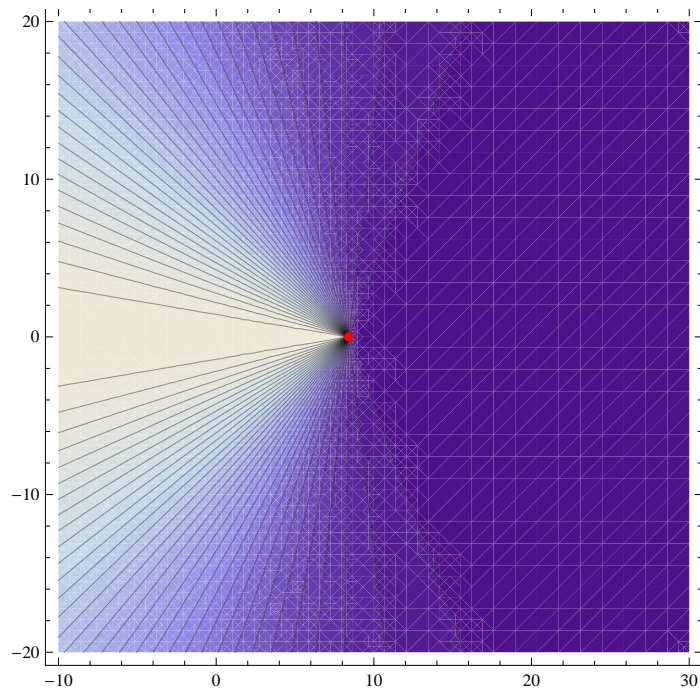
```
Show[
  ContourPlot[tzap[x, y, t], {x, -10, 30}, {y, -20, 20},
    Contours -> Table[k, {k, -200, 200, 2}], PlotPoints -> 30, AspectRatio -> Automatic],
  Graphics[{Red, Disk[{s[t], 0}, 0.3], Thickness[0.004]}]
]
```



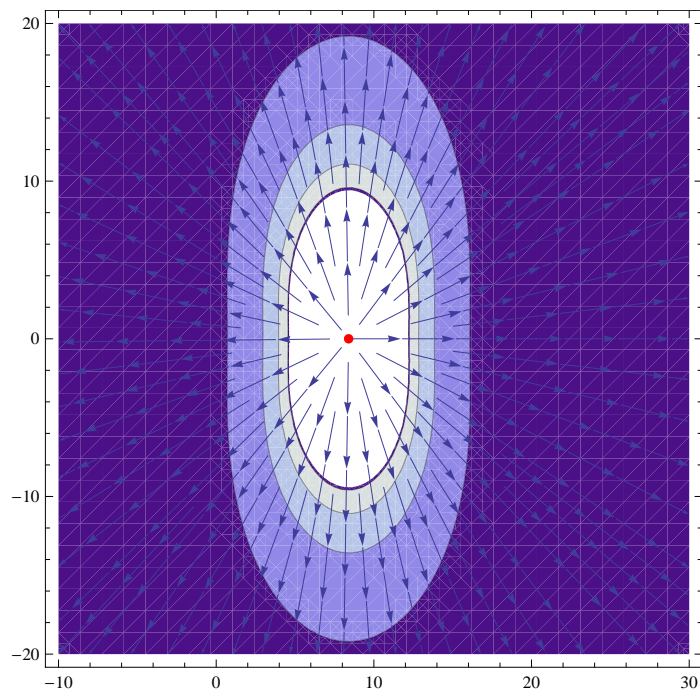
```
Show[
  ContourPlot[Rlw[x, y, t], {x, -10, 30}, {y, -20, 20},
    Contours -> Table[k, {k, 1, 25, 1}], PlotPoints -> 30, AspectRatio -> Automatic],
  Graphics[{Red, Disk[{s[t], 0}, 0.3], Thickness[0.004]}]
]
```



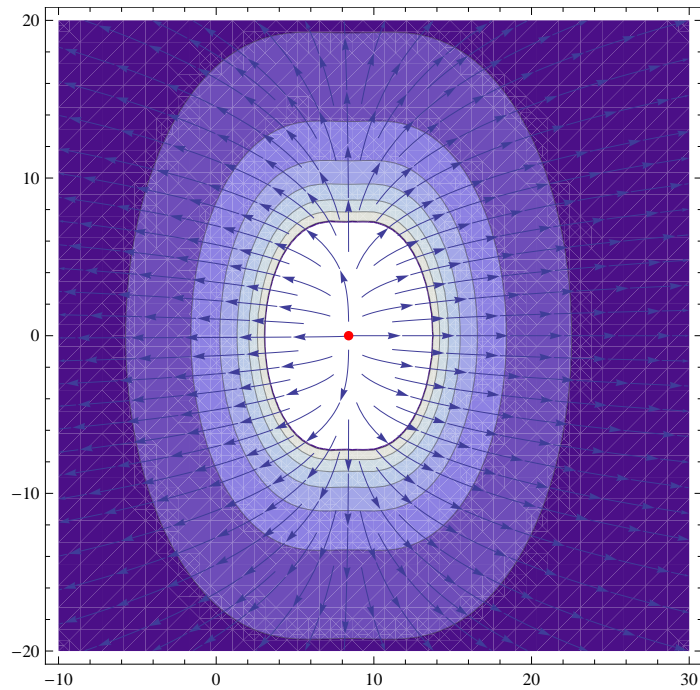
```
Show[
  ContourPlot[klw[x, y, t], {x, -10, 30}, {y, -20, 20},
    Contours -> Table[k, {k, 0.05, 5, 0.05}], PlotPoints -> 30, AspectRatio -> Automatic],
  Graphics[{Red, Disk[{s[t], 0}, 0.3], Thickness[0.004]}]
]
```



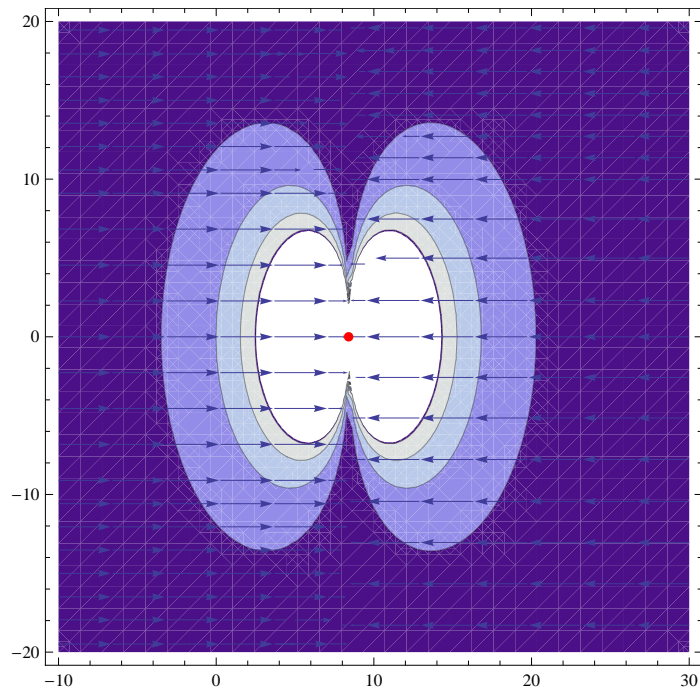
```
Show[
  ContourPlot[electrM[x, y, t], {x, -10, 30}, {y, -20, 20},
    Contours -> Table[k, {k, 0.005, 2, 0.005}], PlotPoints -> 30, AspectRatio -> Automatic],
  StreamPlot[electr[x, y, t], {x, -10, 30}, {y, -20, 20}, AspectRatio -> Automatic],
  Graphics[{Red, Disk[{s[t], 0}, 0.3], Thickness[0.004]}]
]
```



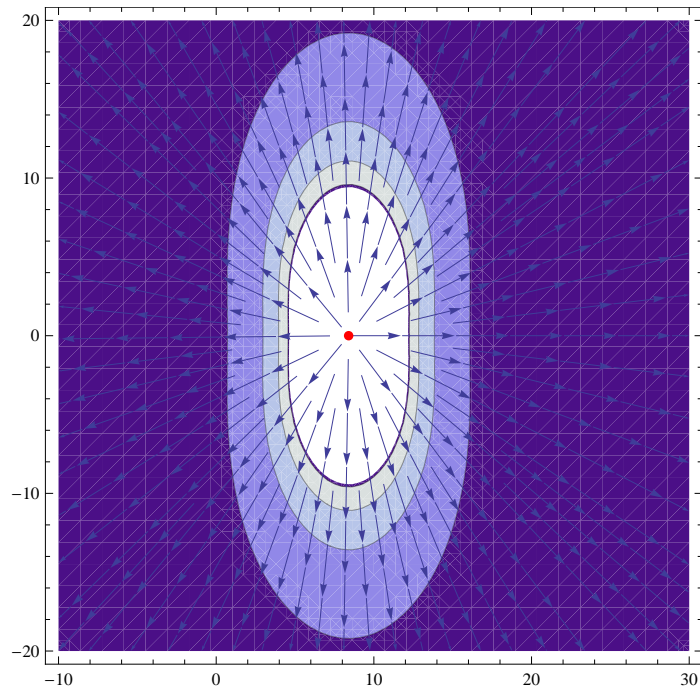
```
Show[
  ContourPlot[electrgradphiM[x, y, t], {x, -10, 30}, {y, -20, 20},
    Contours -> Table[k, {k, 0.005, 2, 0.005}], PlotPoints -> 30, AspectRatio -> Automatic],
  StreamPlot[electrgradphi[x, y, t], {x, -10, 30}, {y, -20, 20}, AspectRatio -> Automatic],
  Graphics[{Red, Disk[{s[t], 0}, 0.3], Thickness[0.004]}]
]
```



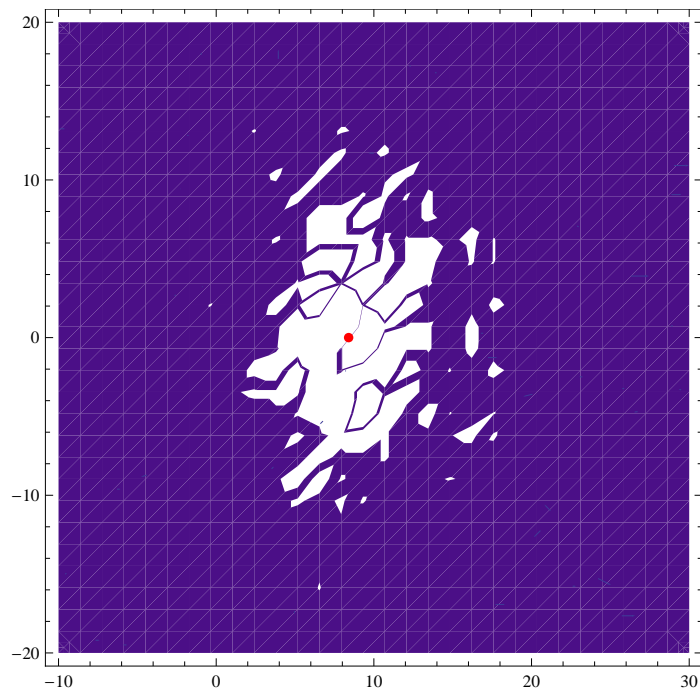
```
Show[
  ContourPlot[electrAdtM[x, y, t], {x, -10, 30}, {y, -20, 20},
    Contours -> Table[k, {k, 0.005, 2, 0.005}], PlotPoints -> 30, AspectRatio -> Automatic],
  StreamPlot[electrAdt[x, y, t], {x, -10, 30}, {y, -20, 20}, AspectRatio -> Automatic],
  Graphics[{Red, Disk[{s[t], 0}, 0.3], Thickness[0.004]}]
]
```



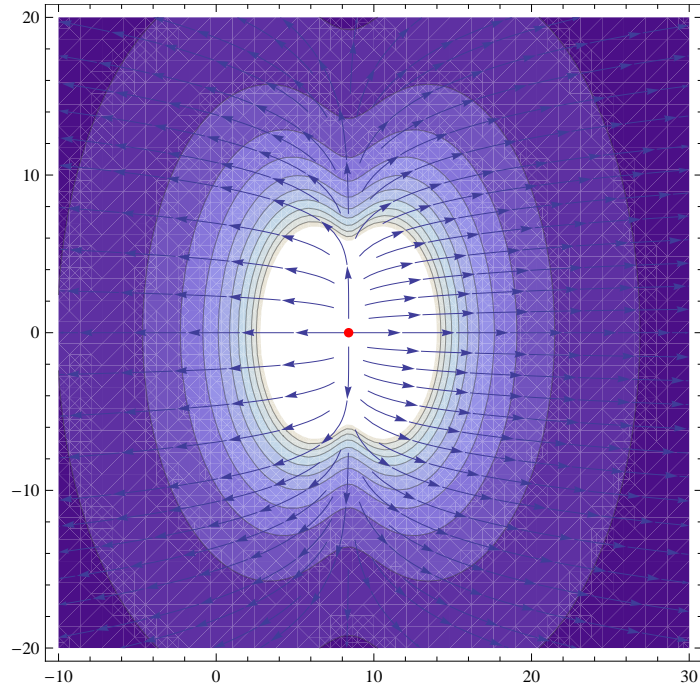
```
Show[
  ContourPlot[electrMM[x, y, t], {x, -10, 30}, {y, -20, 20},
    Contours -> Table[k, {k, 0.005, 2, 0.005}], PlotPoints -> 30, AspectRatio -> Automatic],
  StreamPlot[electrgradphi[x, y, t] + electrdAdt[x, y, t], {x, -10, 30}, {y, -20, 20},
    AspectRatio -> Automatic], Graphics[{Red, Disk[{s[t], 0}, 0.3], Thickness[0.004]}]
]
```



```
Show[
  ContourPlot[electrMM[x, y, t] - electrM[x, y, t], {x, -10, 30}, {y, -20, 20},
    Contours -> Table[k, {k, 0.005, 2, 0.005}], PlotPoints -> 30, AspectRatio -> Automatic],
  StreamPlot[electrgradphi[x, y, t] + electrdAdt[x, y, t] - electr[x, y, t],
    {x, -10, 30}, {y, -20, 20}, AspectRatio -> Automatic],
  Graphics[{Red, Disk[{s[t], 0}, 0.3], Thickness[0.004]}]
]
```



```
Show[
  ContourPlot[electrMPM[x, y, t], {x, -10, 30}, {y, -20, 20},
    Contours → Table[k, {k, 0.005, 2, 0.005}], PlotPoints → 30, AspectRatio → Automatic],
  StreamPlot[electrgradphi[x, y, t] - electrAdt[x, y, t], {x, -10, 30}, {y, -20, 20},
    AspectRatio → Automatic], Graphics[{Red, Disk[{s[t], 0}, 0.3], Thickness[0.004]}]
]
```



```
(*ss=Monitor[Table[
  Show[
    ContourPlot[electrM[x,y,t],{x,-10,30},{y,-10,10},
      Contours→Table[k,{k,0.005,2,0.005}], PlotPoints→30,AspectRatio→Automatic],
    StreamPlot[electr[x,y,t],{x,-10,30},{y,-10,10},AspectRatio→Automatic],
    Graphics[{Red,Disk[{s[t],0},0.3],Thickness[0.004]}]
  ],
  {t,0,20,0.25}],
t];*)

(*Export["D://lw-electr-v=const_not_log.gif",ss]*)
```