```
function [dzdt r dV Fin Fout] = rozenberg (z,t,p)

  persistent N Su Sd;
  if isempty (N)
    N    = size (z,1);
    ONES = ones (1,N-1);
    # Shift matrices
    Su = sparse (diag (ONES,1));
    Sd = sparse (diag (ONES,-1));
  endif

  # Local resitivity
  r  = p.A .* z;
  # Local voltage drop
  dV = p.V(t) * (r / sum (r));

  # Transition exponentials
  edV  = exp (dV  -p.dV0);
  emdV = exp (-dV -p.dV0);

  # Flows
  nz   = 1 - z;
  # Flow out of site
  Fout = z  .* ( emdV .* (Sd * nz) + edV .* (Su * nz) );
  # Flow into site
  Fin  = nz .* ( Sd * (  z .* edV  ) + Su * (  z .* emdV ) );

  dzdt = Fin - Fout;  # Net flow
```

../../memNet/mFiles/Rozenberg_model/rozenberg.m

References

M. J. Rozenberg, M. J. Sánchez, R. Weht, C. Acha, F. Gomez-Marlasca, and P. Levy. Mechanism for bipolar resistive switching in transition-metal oxides. *Physical Review B*, 81(11):115101, March 2010. ISSN 1098-0121. doi: 10.1103/PhysRevB.81.115101. URL http://link.aps.org/doi/10.1103/PhysRevB.81.115101.

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