compute_geopot(ps,rhodz,theta, pk,geopot)

(caldyn_eta==eta_mass)

(Compute exner function and geopotential)

l = 1,llm

ij=ij_begin_ext,ij_end_ext

p_ik = ptop + mass_ak(l) + mass_bk(l)*ps(ij)

exner_ik = cpp * (p_ik/preff) ** kappa

pk(ij,l) = exner_ik

(specific volume v = kappa*theta*pi/p = dphi/g/rhodz)

geopot(ij,l+1) = geopot(ij,l) + (g*kappa)*rhodz(ij,l)*theta(ij,l)*exner_ik/p_ik

(We are using a Lagrangian vertical coordinate
Pressure must be computed first top-down (temporarily stored in pk)
Then Exner pressure and geopotential are computed bottom-up)

(Notice that the computation below should work also when caldyn_eta=eta_mass)

(boussinesq)

(compute only geopotential :
pressure pk will be computed in compute_caldyn_horiz
specific volume 1 = dphi/g/rhodz)

l = 1,llm

ij=ij_begin_ext,ij_end_ext

geopot(ij,l+1) = geopot(ij,l) + g*rhodz(ij,l)

(non-Boussinesq, compute geopotential and Exner pressure)

(uppermost layer)

ij=ij_begin_ext,ij_end_ext

pk(ij,llm) = ptop + (.5*g)*rhodz(ij,llm)

(other layers)

l = llm-1, 1, -1

ij=ij_begin_ext,ij_end_ext

pk(ij,l) = pk(ij,l+1) + (.5*g)*(rhodz(ij,l)+rhodz(ij,l+1))

(surface pressure (for diagnostics))

ij=ij_begin_ext,ij_end_ext

ps(ij) = pk(ij,1) + (.5*g)*rhodz(ij,1)

(specific volume v = kappa*theta*pi/p = dphi/g/rhodz)

l = 1,llm

ij=ij_begin_ext,ij_end_ext

p_ik = pk(ij,l)

exner_ik = cpp * (p_ik/preff) ** kappa

geopot(ij,l+1) = geopot(ij,l) + (g*kappa)*rhodz(ij,l)*theta(ij,l)*exner_ik/p_ik

pk(ij,l) = exner_ik

compute_geopot