About Sea Ice & double diffusive layering

I replicated one more way of doing pure substance melting, which models as porous media

There is one more way to do it, will use it for doing melting of binary alloy where solidus &liquidus temperature are different

Built &validated our double diffusion convection solver with paper will send results in few days

Did sea ice (not exactly) by mixing salt + water (decrease in melting point) in freezer.

I think difficulty is in modelling rejection of salt when solidifying, when melting release of fresh water

Next will take up layering instability in double diffusion convection

So, Example of cold & fresh water on top could be rain, rivers etc.

Example of warm & salty above could be evaporation

Most of the times it is interior if I'm not wrong.

I will also try to do small experiment to see salt fingering using colors (Ujala)

I also found some work on sediment fingering (which could come from mountains during rain or rainy water which contains mud, stones carried to ocean)

It involves settling convection & salt fingering (particle double diffusion diffusion convection)

Will do double diffusion salt fingering first, later move to particle settling convection where sedimentation is placed above salty water, later move to double diffusion sediment fingering.

Will also do salt (rock salt, powdered salt) placed above fresh water & see its settling

Random idea of triple diffusion came to me (heat, salt, sedimentation of particles) will try that as well.

Will proceed slowly step by step & keep you updated.

About paper you told to read

Thank you for asking me to do it, it is one of the best papers I've read. Grateful for already making me learn a lot.

The jet ascending like fountain, later lateral spreading, then layering, then fingers/settling of particles in these layers.

That Mushroom, also could relate to trees, umbrella which we see around

I could not get the book also some papers aren't available in ScienceDirect, Once I'm in campus will download it & read the chapters you told.

As substitute till I get it, reading atmospheric thermodynamics by Tsonis

Instability in Immiscible fluids

Started reading paper on two phase Rayleigh Bernard convection will replicate it first, later will move to KH, Rayleigh Taylor instability.