DEDICATION

To My Dear Father------the symbol of wisdom

To My Mother------ the essence of my life

My Brothers and Sisters

My Friends and All My Family

To All those who gave me

Enough support during my work.

Supervisor

Dr. Bakri *Mirghani Ahmed*

AKNOWLEDGEMENT

First before all I thank my God (Allah) who best owed me health and energy to work actively during this period.

I am greatly indebted to my supervisor, Dr. Bakri Mirghani Ahmed for guidance and help throughout the study period,

Dr. Shawgy Hussein Abd Alla generously and patiently gave me precious long hours that positively added to every part of this work.

I appreciate the role of my Family members who have given me the moral encouragement.

Last but not least, I would like to thank all those who have helped in carrying out the research.

Abstract

We present a mainly theoretical study of high-Reynolds-number planar gravity currents in a uniformly flowing deep ambient. The gravity currents are generated by a constant line source of fluid, and may also be supplied with a source of horizontal momentum and a source of particles. We model the motion using a shallow-water approximation and represent the effects of the ambient flow by imposing a Froude -number condition in a moving frame. We present analytic and numerical expressions for the threshold ambient flow speed above which no upstream propagation can occur at longtime. For homogeneous gravity currents in an ambient flow below threshold, we find similarity solutions in which the up- and downstream fronts spread at a constant rate and the current propagates indefinitely in both directions. For gravity currents consistingofbothinterstitial fluid of a different density to the ambient and sediment in gparticle load, we find long-time asymptotic solutions for ambient flow strengths below threshold

الخلاصة

في هذا البحث نـ قدم بصفة نظرية انسياب تيار تثا قلي مستوي له عدد رينولدز عالي خلال تيار محيط مست قر وعميق . التيارات التثا قلية تتولد بواسطة مصدر ثابت من المائع . ويمكن تطبيق ذلك بمصدر لمدة بمنبع له دفع أف قى من الجسيمات . نضع نموذج للحركة في شكل طب قة ضحلة من المائع وتمثل لاثر التيار المحيط بافتراض شرط علي عدد فرود في هيكل متحرك . تعطي قيم تحليلية وعددية لحالة العتبة للانسياب المحيط التي فو قها لايمكن ان يصعد علي المدي الطويل تيار تثا قلي متجانس اسفل العتبة يوجد حل متماثل في حالتي التيار الصاعد والهابط في سرعات منتظمة .

-:Thesis Contents •