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التوثيق الالكتروني والميكروفيلم



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جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
على هذه الأفلام قد اعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %



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بعض الوثائق الأصلية تالفة



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بالرسالة صفحات
لم ترد بالأصل

**2-D MODEL FOR CONTAMINANT TRANSPORT
THROUGH MEANDERING CHANNELS USING
DEPTH-AVERAGED EQUATIONS**

by

Eng./ WAEL TAHA AHMAD ALDAHSHOORY

**A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY
in
Civil Engineering**

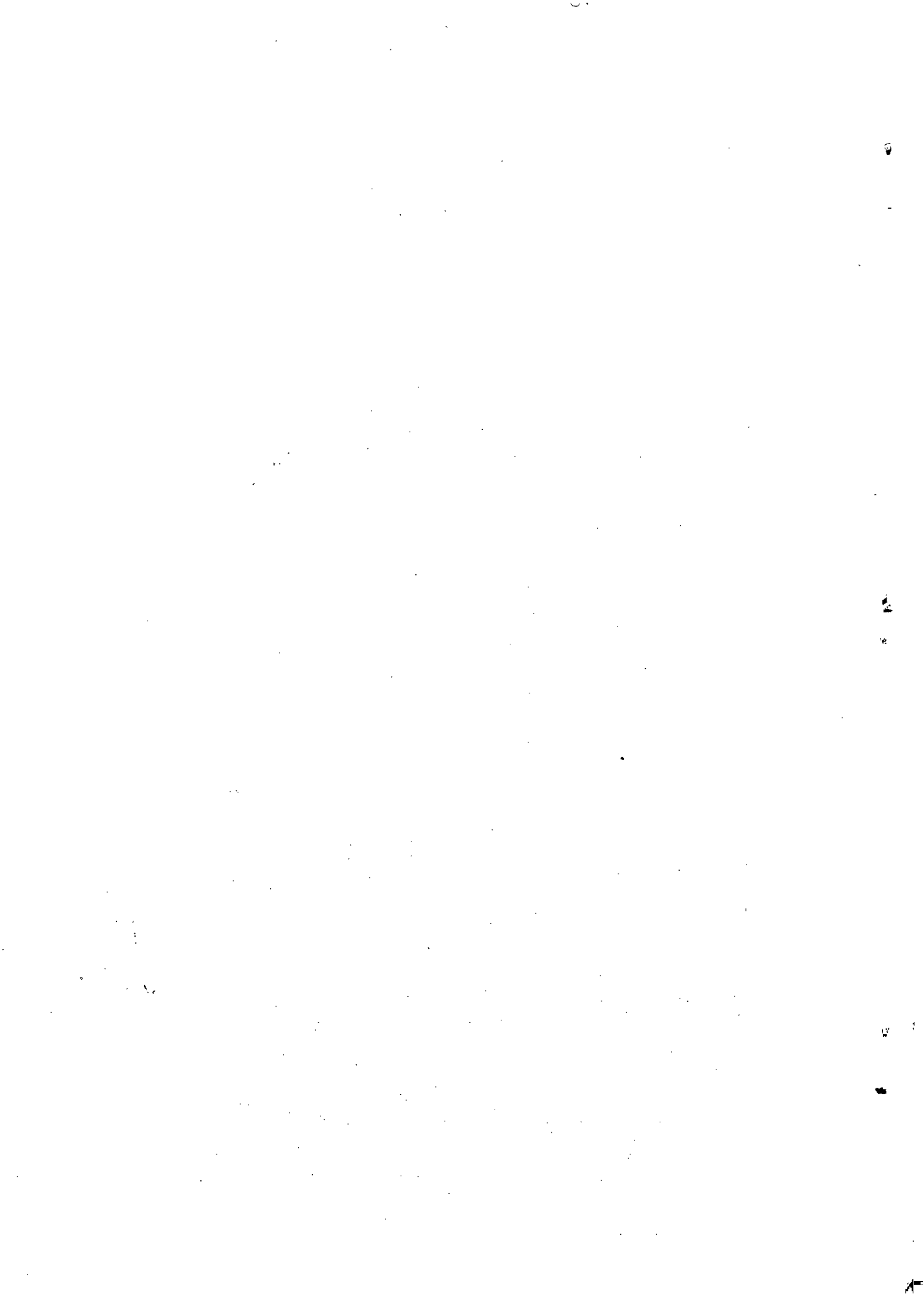
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**FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
April 2003**

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Approved by the
Examining Committee

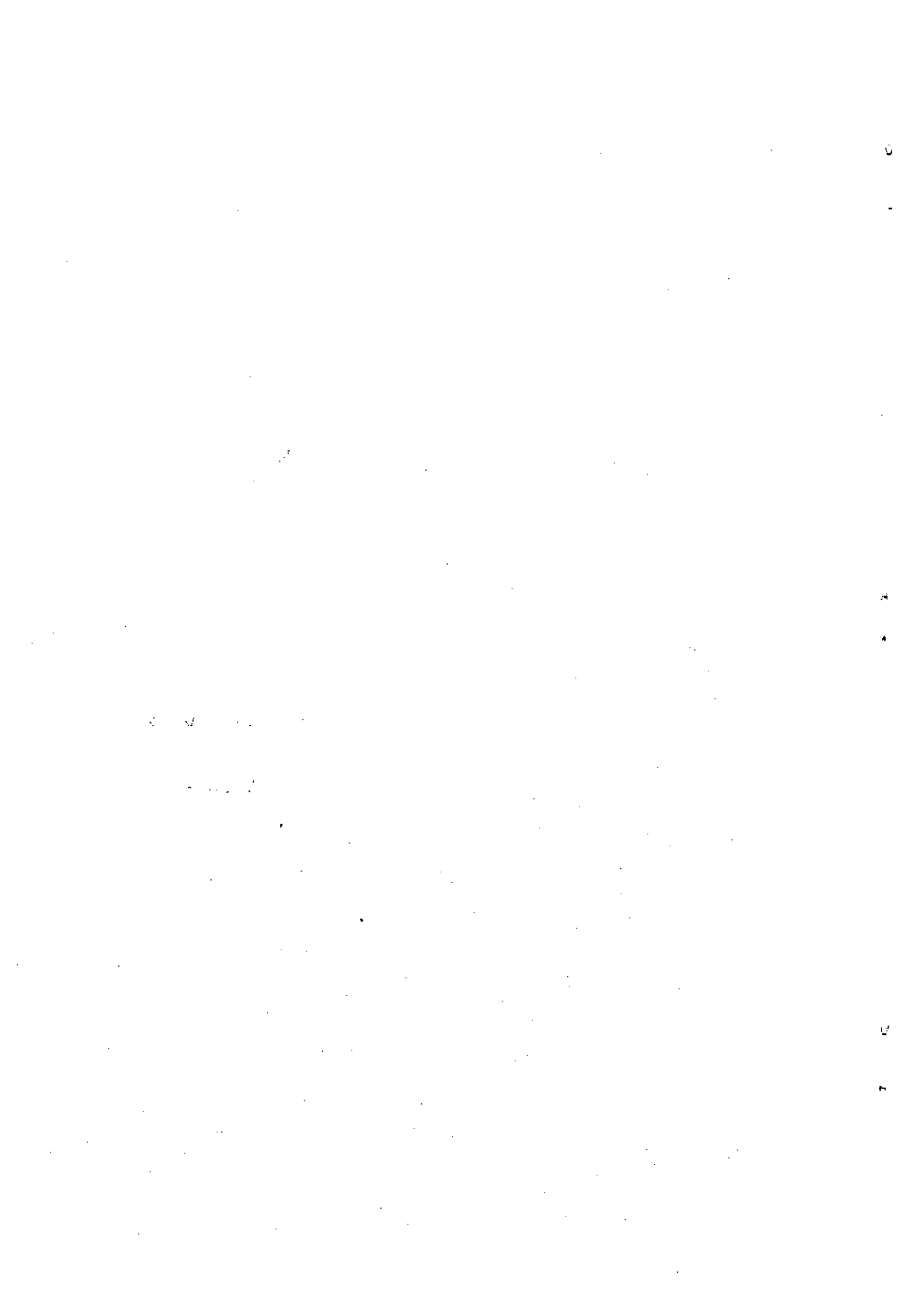
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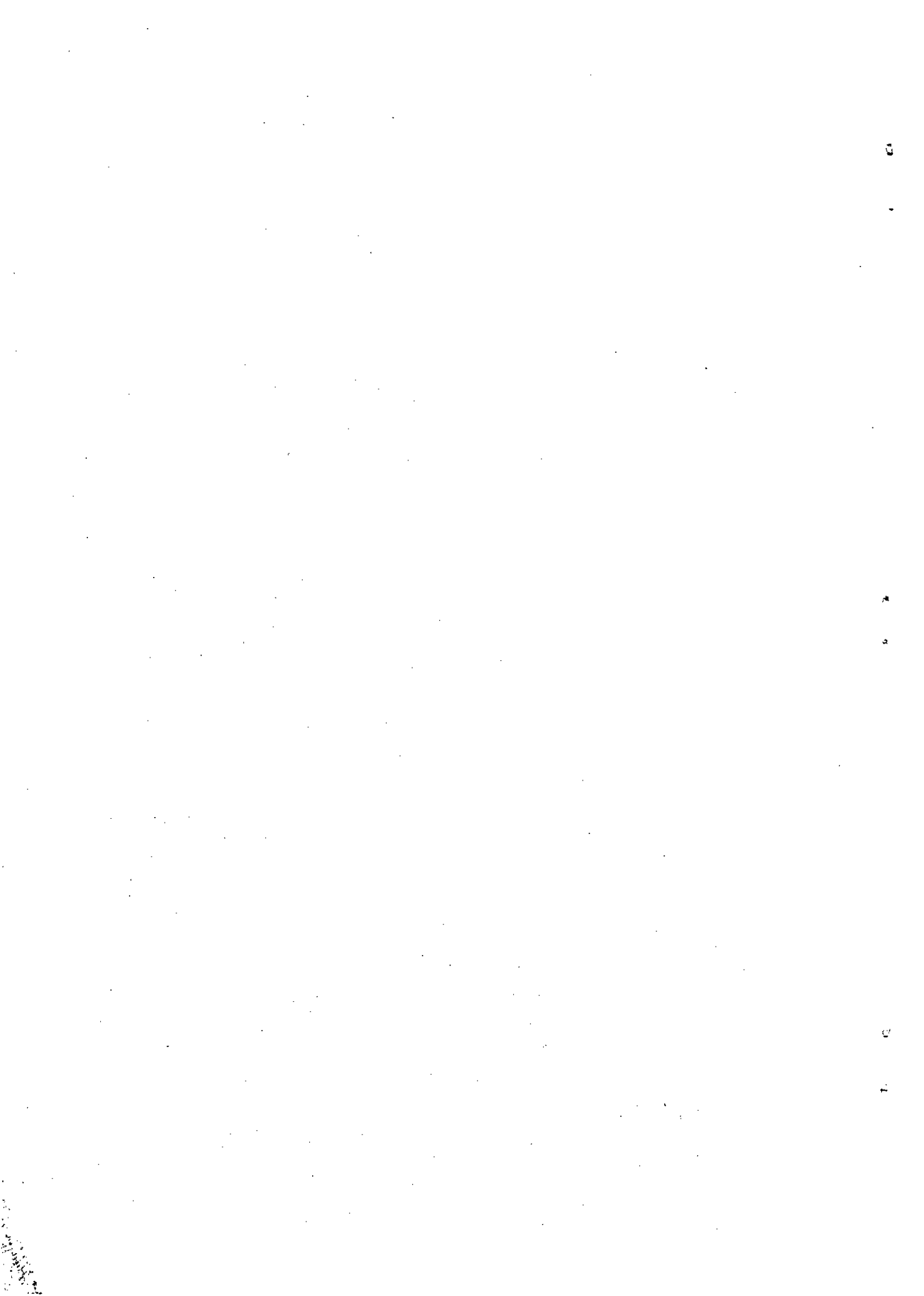


ABSTRACT

A two dimensional, depth averaged numerical model is developed to describe the water flow in open channels and predicts contaminant concentrations at any point of the studied domain.

The finite difference method is used to solve 2-D, depth averaged, shallow water equations and contaminant equation. The governing equations are transformed into generalized curvilinear body-fitted coordinate system. Therefore, the model can be applied to irregular boundaries as in the most natural waterways. The effective stresses are represented in the developed model by using the constant eddy viscosity approach. Then, the governing equations are solved by using the Beam and Warming Alternating Direction Implicit (ADI) scheme.

The numerical model is verified by comparing the computed results with the available measured and computed data. Good agreement is obtained in the verification step. The model is applied to compute the contaminant migration in many cases such as: a channel subjected to line or point contaminant source, a channel subjected to combined line and point contaminant sources, a channel where the flow varies with time. Contamination for flow in converging channel, and flow in a channel bend was also tested using the proposed model. The model was also applied to Rosetta branch of river Nile to simulate contaminant dispersion through a selected sub-reach, and the results gave good agreement with the measured data. The proposed depth averaged model may also be used to satisfactory simulate flow and contaminant dispersion for irregular boundary channels, rapidly varied flow, and gradually varied flow.



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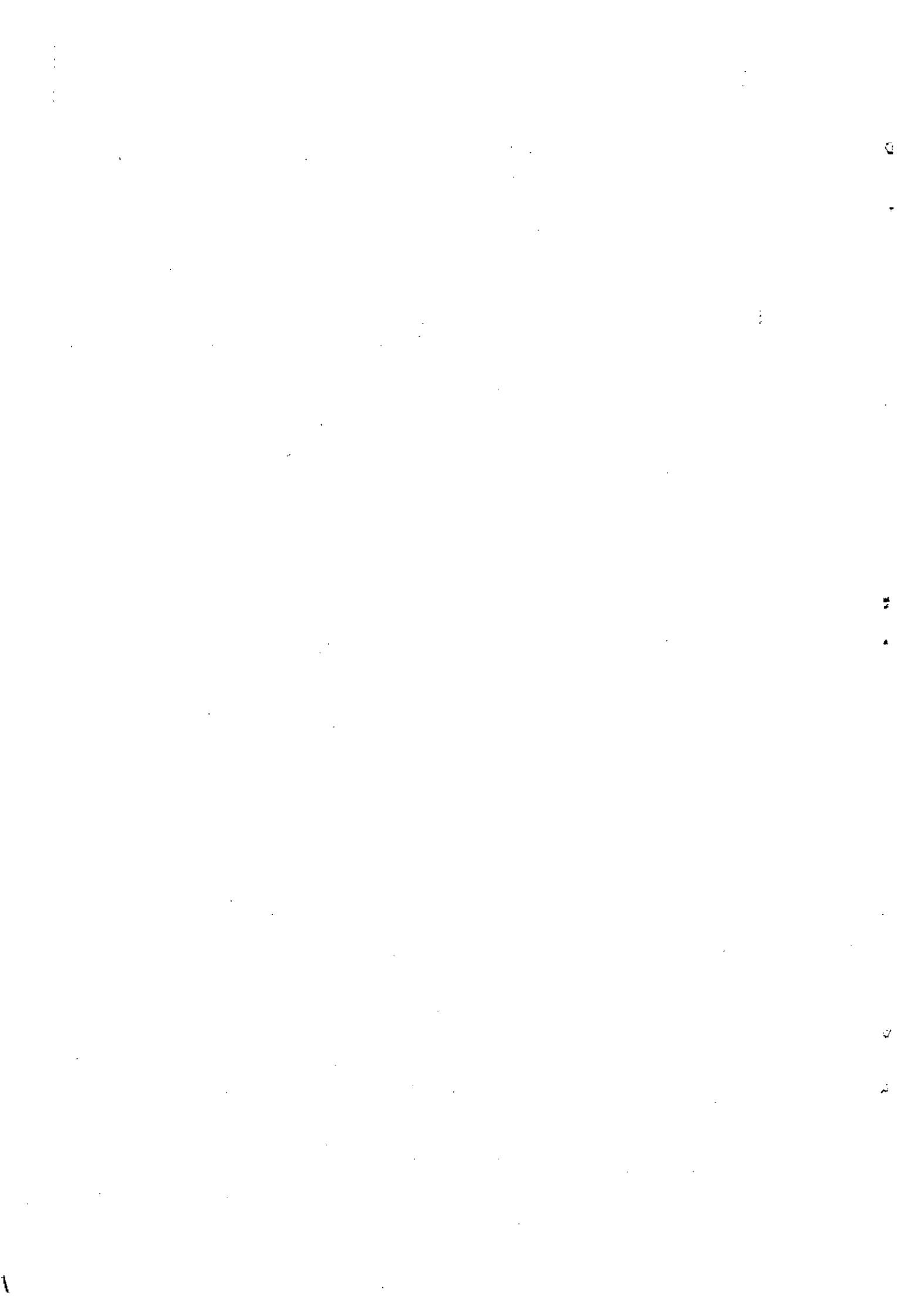
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I would like to express my deep appreciation to *my mother* and *my wife* for being supportive, patient, and kind throughout the years of the study.

I would like to dedicate this work to the soul of *my father* whose support and love are the most precious memoirs I have.



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