

**CHARACTERISTICS AND WAVE NORMALS
APPLIED TO
ATMOSPHERIC PRESSURE WAVES
GENERATED BY A MOVING
HEAT SOURCE**

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Dedication

*To my parents, sisters,
brothers and friends .*

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Abstract

This dissertation discusses the method of characteristics and waves normals used in finding the solutions of hyperbolic partial differential equations.

It is then applied to study the nature of atmospheric pressure. Through the waves generated by a heat source uniformly travelling in a The results for a point source are that three types of waves can propagate. These types are classified by ranges of source speed and frequency of emitted wave . One type propagates horizontally , a second type propagates vertically and a third type propagates in all directions .The reflection of waves by the ground surface is also considered for each of the three types.

The waves due to extended heat sources and the cut off frequencies of propagation of each type are also discussed.



ناقشت هذه الرسالة طريقة المميزات والأعـمدة الخاصة بالموجات المستخدمة في حل المعادلات التفاضلية الجزئية الزائدية و من ثم طـبقـت الطريـقة لدراسة طبيعة موجات الضغط الجوي الصادرة من مصدر حراري متحرك بانتظام في خط أفقي خلال غلاف جوي ذي طبقات.

كانت النتائج في حالة مصدر حراري نـقـطي : إمكانية انتشار ثلاثة أنواع من الموجات ، هذه الأنواع مفصلة حسب مدي سرعة المصدر و تردد الموجات الصادرة منه.

النوع الأول ينتشر أفقياً والنوع الثاني ينتشر رأسيًا والنوع الثالث ينتشر في كل الاتجاهات و قد شملت الدراسة أيضاً انعكاس الموجات عند سطح الأرض في الحالات الثلاثة.

تم أيضاً مناقش الموجات المولده من مصادر حرارية ممتده و كذلك انقطاع مدي التردد للموجات المرسله من المصدر لكل نوع من الأنواع المذكورة أعلاه.

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