EEM 323

REVIEW
ELECTROMAGNETIC WAVE THEORY II

2013 – 2014 FALL SEMESTER

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KAYNAKÇA

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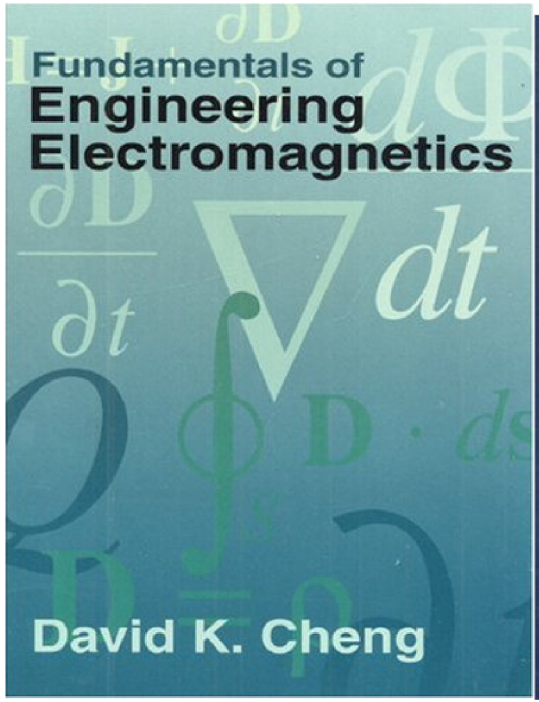
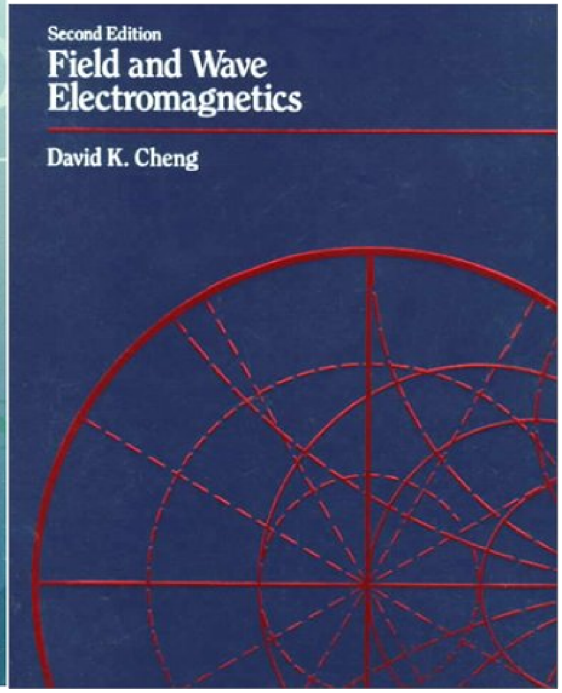
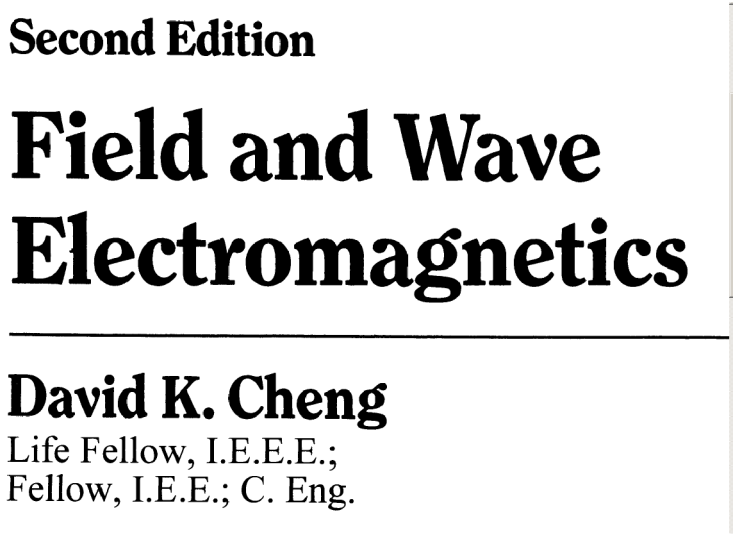
REVIEW OF ELECTROMAGNETIC WAVE THEORY II (PART 1)

(EEM323)

We will review 'Time-varying electromagnetic fields' in this lecture:

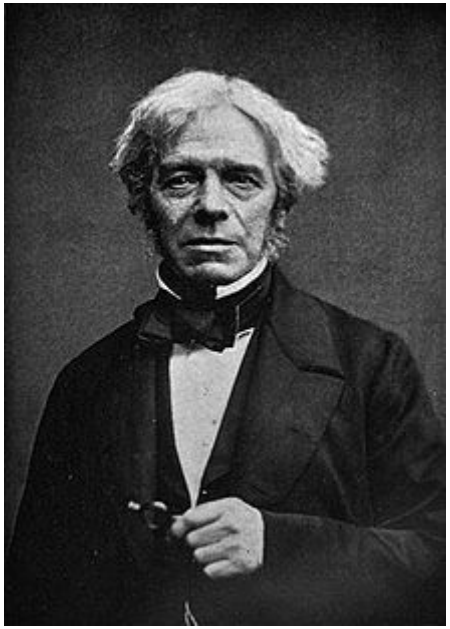






ELEKTRİK ALANI İLE MANYETİK ALANI SABİT OLDUKLARI TAKDİRDE (ZAMAN İÇERİSİNDE DEĞİŞMEYEN / DURGUN / DURAĞAN) BİRBİRLERİNDEN BAĞIMSIZDIRLAR !..

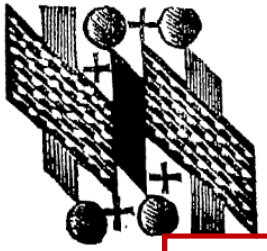
Michael Faraday (1761 - 1867)



‘The Forces of Matter’

‘Experimental Researches in Electricity’

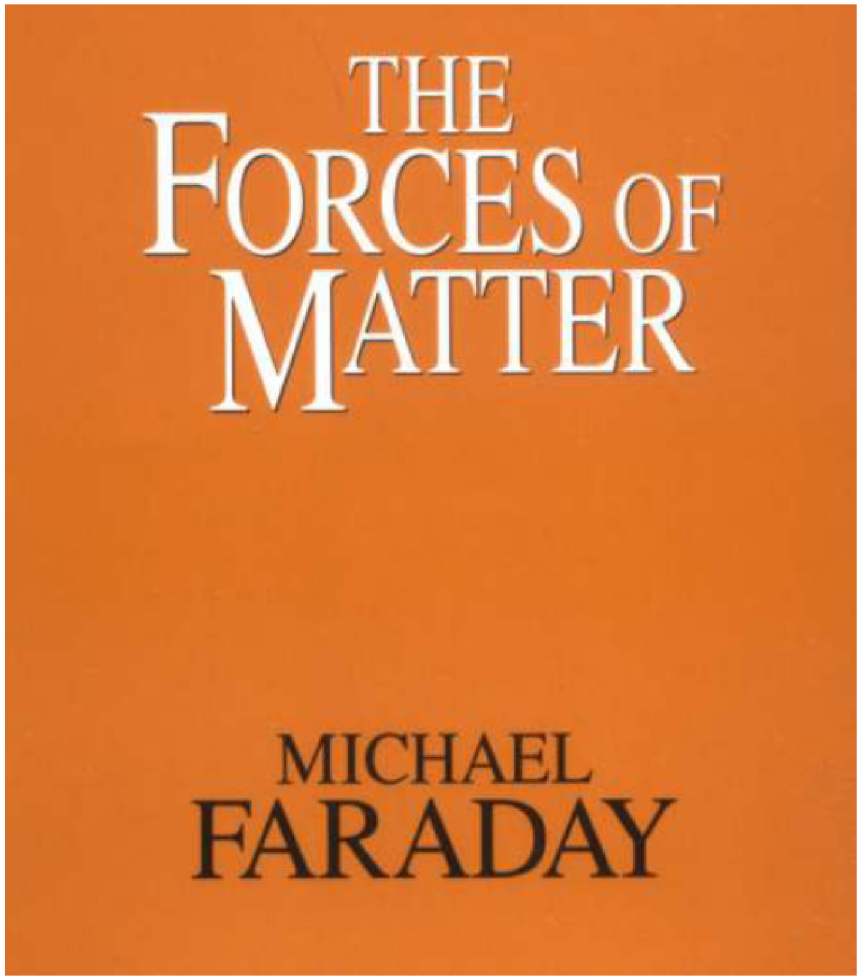
EXPERIMENTAL RESEARCHES IN ELECTRICITY



MICHAEL FARADAY, D.C.L., F.R.S.

LONDON: J. M. DENT & SONS LTD.
NEW YORK: E. P. DUTTON & CO. INC.

FARADAY'S LAW OF ELECTROMAGNETIC INDUCTION



LECTURES ON THE FORCES OF MATTER

Michael Faraday

TRANSFORMERS

James Clerk Maxwell (1831 - 1879)

1865: ‘A Dynamical Theory of the Electromagnetic Field’

MAXWELL'S EQUATIONS

James Clerk Maxwell

A Dynamical Theory of the Electromagnetic Field

with an appreciation by

ALBERT EINSTEIN

edited and introduced by

THOMAS F. TORRANCE

POTENTIAL FUNCTIONS

ELECTROMAGNETIC BOUNDARY CONDITIONS

WAVE EQUATIONS AND THEIR SOLUTIONS

SOURCE-FREE WAVE EQUATIONS

TIME-HARMONIC FIELDS

THE USE OF PHASORS

TIME-HARMONIC ELECTROMAGNETICS

SCALAR POTENTIAL AND VECTOR POTENTIAL

Hermann Ludwig Ferdinand von Helmholtz (1821-1894)

SOURCE-FREE FIELDS IN SIMPLE MEDIA

HOMOGENEOUS VECTOR / HELMHOLTZ EQUATIONS

HOMOGENEOUS VECTOR / HELMHOLTZ EQUATIONS

ELECTROMAGNETIC SPECTRUM

8

Plane Electromagnetic Waves

DOPPLER EFFECT

TRANSVERSE ELECTROMAGNETIC WAVES

POLARIZATION OF PLANE WAVES

Linear, Circular and Elliptical Polarization Animation in a Single Shot.mp4

PLANE WAVES IN LOSSY MEDIA

LOW-LOSS DIELECTRICS

GOOD CONDUCTORS

GROUP VELOCITY

FLOW OF ELECTROMAGNETIC POWER

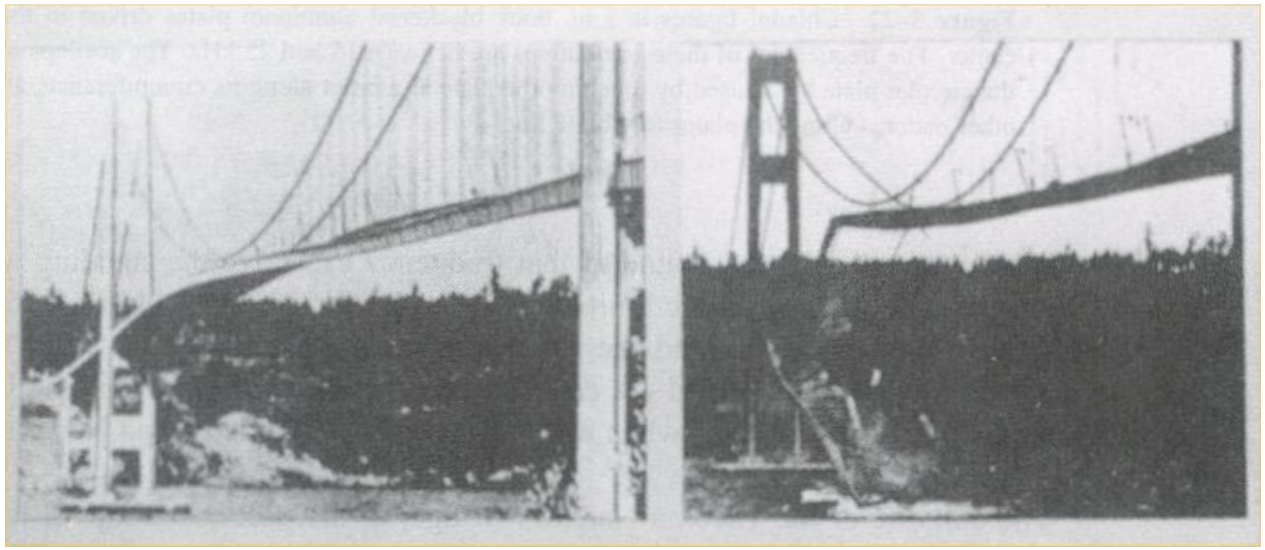
THE POYNTING VECTOR

INSTANTANEOUS POWER DENSITY

AVERAGE POWER DENSITY

NORMAL INCIDENCE AT A PLANE CONDUCTING BOUNDARY

STANDING WAVES



http://www.google.com.tr/url?sa=t&rct=j&q=standing%20waves%20resonance%20in%20violins&source=web&cd=10&cad=rja&ved=0CHsQFjAJ&url=http%3A%2F%2Fwww.physics.umd.edu%2Flecdem%2Fmisc%2Fphys102%2FPH102chap03.ppt&ei=vuUWUciZKIGZhQf9sYDYBg&usg=AFQjCNG2GO3vn-Fw_ozEiJK36Td-JA1h0w&bvm=bv.42080656,d.d2k

OBLIQUE INCIDENCE AT A PLANE CONDUCTING BOUNDARY

PERPENDICULAR POLARIZATION

PARALEL POLARIZATION

NORMAL INCIDENCE AT A PLANE DIELECTRIC BOUNDARY

REFLECTION COEFFICIENT (Γ)

TRANSMISSION COEFFICIENT (τ)

REFLECTION COEFFICIENT (Γ) AND TRANSMISSION COEFFICIENT (τ) ARE RELATED AS GIVEN BELOW:

STANDING WAVE RATIO

INCIDENCE AT MULTIPLE DIELECTRIC INTERFACES

(NORMAL) (OBLIQUE)

TOTAL REFLECTION (CRITICAL ANGLE)

+ POLARIZATION FILTERING SUNGLASSES !