

## Prof. İbrahim Akduman

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### International Researcher IDs

ORCID: 0000-0002-5769-6032

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### Education Information

Doctorate, Istanbul Technical University, Fen Bilimleri Enstitüsü, Elektronik Ve Haberleşme Mühendisliği Anabilim Dalı, Turkey 1987 - 1990

Postgraduate, Istanbul Technical University, Fen Bilimleri Enstitüsü, Elektronik Ve Haberleşme Mühendisliği Anabilim Dalı, Turkey 1984 - 1987

Undergraduate, Istanbul Technical University, Elektrik Fakültesi, Elektronik Ve Haberleşme Pr., Turkey 1980 - 1984

### Foreign Languages

English

### Dissertations

Doctorate, Bir tabaka içindeki cisimlerle ilgili iki boyutlu ters saçılma problemleri, İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Elektronik Ve Haberleşme Mühendisliği Anabilim Dalı, 1990

Postgraduate, Statik Alanlara İlişkin Bir Grup Ters Saçılma problemi, İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Elektronik Ve Haberleşme Mühendisliği Anabilim Dalı, 1987

### Research Areas

Health Sciences, Engineering and Technology

### Academic and Administrative Experience

İstanbul Teknik Üniversitesi, Rektörlük, 2012 - Continues

İstanbul Teknik Üniversitesi, Elektrik-Elektronik Fakültesi, 2010 - Continues

İstanbul Teknik Üniversitesi, Elektrik-Elektronik Fakültesi, Elektronik Ve Haberleşme Mühendisliği Bölümü, 2010 - Continues

İstanbul Teknik Üniversitesi, Bilişim Enstitüsü, İleri Teknolojiler Anabilim Dalı, 2008 - Continues

İstanbul Teknik Üniversitesi, Elektrik-Elektronik Fakültesi, Elektronik Ve Haberleşme Mühendisliği Bölümü, 2002 - 2008

İstanbul Teknik Üniversitesi, Rektörlük, 2004 - 2004

İstanbul Teknik Üniversitesi, Elektrik-Elektronik Fakültesi, 1999 - 2001

İstanbul Teknik Üniversitesi, Rektörlük, 1996 - 1999

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Microwave Breast Lesion Classification – Results from Clinical Investigation of the SAFE Microwave Breast Cancer System**  
Janjic A., Akduman İ., Çayören M., BUĞDAYCI O., Aribal M. E.  
Academic Radiology, vol.30, 2023 (SCI-Expanded)
- II. **Comparison of Microwave Hyperthermia Applicator Designs with Forc Dipole and Connected Array**  
Yildiz G., Farhat I., Farrugia L., Bonello J., Zarb-Adami K., Sammut C. V., Yılmaz Abdolsaheb T., Akduman İ.  
Sensors, vol.23, no.14, 2023 (SCI-Expanded)
- III. **Miniaturized coplanar Vivaldi antenna design for brain imaging**  
Uyanik C., Demirel S., Akduman İ.  
Microwave and Optical Technology Letters, vol.65, no.7, pp.2076-2083, 2023 (SCI-Expanded)
- IV. **Continuous Monitoring of Hyperthermia Treatment of Breast Tumors With Singular Sources Method**  
Doğu S., Önal H., Yılmaz Abdolsaheb T., Akduman İ., Akıncı M. N.  
IEEE Access, vol.11, pp.6584-6593, 2023 (SCI-Expanded)
- V. **Monitoring of intracerebral hemorrhage with a linear microwave imaging algorithm**  
Dilman İ., Bilgin E., Akıncı M. N., Cosgun S., Doğu S., Çayören M., Akduman İ.  
MEDICAL & BIOLOGICAL ENGINEERING & COMPUTING, vol.61, no.1, pp.33-43, 2023 (SCI-Expanded)
- VI. **A Guideline for Complex Permittivity Retrieval of TissueMimicking Phantoms From OpenEnded Coaxial Probe Response With Deep Learning**  
Joof S., Aydınalp C., Dilman İ., Akıncı M. N., Yılmaz T., Çayören M., Akduman İ.  
IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, vol.70, no.11, pp.5105-5115, 2022 (SCI-Expanded)
- VII. **Rotationally Adjustable Hyperthermia Applicators: A Computational Comparative Study of Circular and Linear Array Applicators**  
Yıldız Altıntaş G., Yılmaz T., Akduman İ.  
DIAGNOSTICS, vol.12, no.11, 2022 (SCI-Expanded)
- VIII. **Microwave Medical Diagnosis System With a Framework to Optimize the Antenna Configuration and Frequency of Operation Using Neural Networks**  
Jafarifarmand A., Yılmaz T., Akduman İ.  
IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, vol.70, no.11, pp.5095-5104, 2022 (SCI-Expanded)
- IX. **Single-slice microwave imaging of breast cancer by reverse time migration**  
Bilgin E., Çayören M., Joof S., Cansiz G., Yılmaz T., Akduman İ.  
MEDICAL PHYSICS, vol.49, no.10, pp.6599-6608, 2022 (SCI-Expanded)
- X. **Antenna Excitation Optimization with Deep Learning for Microwave Breast Cancer Hyperthermia**  
Yildiz G., Yasar H., Uslu I. E., Demirel Y., Akıncı M. N., Yılmaz T., Akduman İ.  
Sensors, vol.22, no.17, 2022 (SCI-Expanded)
- XI. **Characterization of Open-Ended Coaxial Probe Sensing Depth with Respect to Aperture Size for Dielectric Property Measurement of Heterogeneous Tissues**  
Aydınalp C., Joof S., Dilman İ., Akduman İ., Yılmaz T.  
SENSORS, vol.22, no.3, 2022 (SCI-Expanded)
- XII. **A Method to Measure Complex Dielectric Permittivity With Open-Ended Coaxial Probes**  
Dilman İ., Akıncı M. N., Yılmaz T., Çayören M., Akduman İ.  
IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, vol.71, 2022 (SCI-Expanded)
- XIII. **Microwave Dielectric Property Retrieval From Open-Ended Coaxial Probe Response With Deep**

## Learning

Aydinalp C., Joof S., Akıncı M. N., Akduman İ., Yılmaz T.  
IEEE ACCESS, vol.10, pp.1216-1227, 2022 (SCI-Expanded)

- XIV. **Classification of rat mammary carcinoma with large scale in vivo microwave measurements**  
Önemli E., Joof S., Aydinalp C., PASTACI ÖZSOBACI N., Ates Alkan F., KEPİL N., Rekk I., Akduman İ., Yılmaz T.  
SCIENTIFIC REPORTS, vol.12, no.1, 2022 (SCI-Expanded)
- XV. **SAFE: A Novel Microwave Imaging System Design for Breast Cancer Screening and Early Detection- Clinical Evaluation**  
Janjic A., Çayören M., Akduman I., Yılmaz T., Onemli E., BUĞDAYCI O., ARIBAL M. E.  
DIAGNOSTICS, vol.11, no.3, 2021 (SCI-Expanded)

## Refereed Congress / Symposium Publications in Proceedings

- I. **Performance Evaluation of Two Particle Swarm Optimization Adaptations for Microwave Breast Hyperthermia Focusing**  
Yildiz G., Farhat I., Aydinalp C., Farrugia L., Adami K. Z., Yılmaz Abdolsaheb T., Akduman İ.  
2023 International Applied Computational Electromagnetics Society Symposium, ACES-Monterey 2023, California, United States Of America, 26 - 30 March 2023
- II. **Alternating-Frequency Microwave Hyperthermia: Preliminary Results**  
Yildiz G., Topsakal E., Yılmaz Abdolsaheb T., Akduman İ.  
2023 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, AP-S/URSI 2023, Oregon, United States Of America, 23 - 28 July 2023, vol.2023-July, pp.785-786
- III. **Connected FORA Array Antenna Grouping for Cost Efficiency: Study on Microwave Breast Hyperthermia**  
Yildiz G., Farhat I., Farrugia L., Adami K. Z., Yılmaz Abdolsaheb T., Akduman İ.  
2023 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, AP-S/URSI 2023, Oregon, United States Of America, 23 - 28 July 2023, vol.2023-July, pp.1263-1264
- IV. **Antenna Array Optimization via Deep Learning for Breast Cancer Microwave Hyperthermia Application: Preliminary Results**  
Altıntaş G., Yasar H., Uslu I. E., Demirel Y., Joof S., Akıncı M. N., Yılmaz Abdolsaheb T., Akduman İ.  
2022 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, AP-S/URSI 2022, Colorado, United States Of America, 10 - 15 July 2022, pp.697-698
- V. **Dielectric Property Retrieval with Open-Ended Coaxial Probe for Solid Materials**  
Aydinalp C., Joof S., Akıncı M. N., Akduman İ., Yılmaz T.  
IEEE USNC-URSI Radio Science Meeting / Joint IEEE Antennas-and-Propagation-Society (AP-S) International Symposium, Colorado, United States Of America, 10 - 15 July 2022, pp.13-14
- VI. **An Autonomous Robotic System for Ground Surface and Subsurface Imaging**  
Yılmaz A., Ervan O., Temeltaş H., Akduman İ.  
8th International Conference on Engineering and Emerging Technologies, ICEET 2022, Kuala-Lumpur, Malaysia, 27 - 28 October 2022
- VII. **Monitoring tumor response during chemotherapy treatment with Microwave Imaging**  
Janjic A., Yılmaz Abdolsaheb T., Çayören M., Akduman İ., Crocco L.  
14th European Conference on Antennas and Propagation (EuCAP), Copenhagen, Denmark, 15 - 20 March 2020
- VIII. **Sensitivity and Sensing Depth Analysis of Open-ended Contact Probes for Cancer Diagnosis**  
AYDINALP C., sulayman j., AKDUMAN İ., YILMAZ ABDOLSAHEB T.  
Photonics and Electromagnetics Research Symposium, Roma, Italy, 17 - 20 June 2019
- IX. **In Vitro Dielectric Properties of Rat Skin Tissue for Microwave Skin Cancer Detection**  
AYDINALP C., JOOF S., YILMAZ ABDOLSAHEB T., PASTACI ÖZSOBACI N., ATEŞ ALKAN F., AKDUMAN İ.  
2019 International Applied Computational Electromagnetics Society Symposium (ACES), 14 - 19 April 2019
- X. **In Vitro Dielectric Properties of Rat Skin Tissue for Microwave Skin Cancer Detection**

Aydinalp C., Joof S., Yilmaz T., Ozsobaci N. P., Alkan F. A., Akduman İ.

International Symposium of Applied-Computational-Electromagnetics-Society (ACES), Florida, United States Of America, 14 - 18 April 2019

- XI. **Sensitivity and Sensing Depth Analysis of Open-ended Contact Probes for Cancer Diagnosis**  
Aydinalp C., Joof S., Akduman İ., Yilmaz Abdolsaheb T.  
PhotonIcs and Electromagnetics Research Symposium - Spring (PIERS-Spring), Rome, Italy, 17 - 20 June 2019, pp.2523-2528
- XII. **In-vivo Microwave Dielectric Properties of Healthy and Carcinogenic Rat Nasal Tissues from 500 MHz to 6 GHz**  
Yilmaz Abdolsaheb T., PASTACI ÖZSOBACI N., Alkan F. A., KEPİL N., Akduman İ.  
6th IEEE-Antennas-and-Propagation-Society (IEEE AP-S) Topical Meeting on Antenna Measurements & Applications (CAMA), Balvi, Latvia, 23 - 25 October 2019, pp.79-80
- XIII. **A New Multi-Static System for Microwave Breast Cancer Imaging: Preliminary Design**  
Akduman İ., Çayören M., ŞAHİNTÜRK H.  
18th Mediterranean Microwave Symposium (MMS), İstanbul, Turkey, 31 October - 02 November 2018, pp.330-331
- XIV. **A New Multi Static System for Microwave Breast Cancer Imaging**  
AKDUMAN İ., ÇAYÖREN M., ŞAHİNTÜRK H.  
18th Mediterranean Microwave Symposium (MMS2018), 31 October - 02 November 2018
- XV. **Tissue Mimicking Phantoms for Microwave Brain Stroke Imaging**  
Joof S., Cansiz G., Özgür S., Yilmaz T., Çayören M., Akduman İ.  
18th Mediterranean Microwave Symposium (MMS), İstanbul, Turkey, 31 October - 02 November 2018, pp.332-333
- XVI. **A Compressive Sensing Application on Microwave Diffraction Tomography for the Microwave Imaging of a Stroke Affected Human Brain**  
BİLGİN E., COŞĞUN S., ÇAYÖREN M., AKDUMAN İ.  
2018 IEEE MTT-S International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization (NEMO), Reykjavik, Iceland, 8 - 10 August 2018
- XVII. **Wideband Antennas for Microwave Brain Stroke Imaging**  
Yilmaz T., Çayören M., Acar M., Akduman İ.  
IEEE-Antennas-and-Propagation-Society International Symposium on Antennas and Propagation / USNC/URSI National Radio Science Meeting, Massachusetts, United States Of America, 8 - 13 July 2018, pp.1143-1144
- XVIII. **Dielectric Property Based Classification of Hepatic Malignancies**  
YILMAZ ABDOLSAHEB T., ÇAYÖREN M., AKDUMAN İ.  
2018 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, 8 - 13 July 2018
- XIX. **Breast Cancer Imaging with a Cylindrical Measurement Fixture**  
YILMAZ ABDOLSAHEB T., ÇAYÖREN M., AKDUMAN İ.  
2018 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, 8 - 13 July 2018
- XX. **Imaging of Pulmonary Edema with Microwaves - Preliminary Investigation**  
DOĞU S., DİLMAN İ., ÇAYÖREN M., AKDUMAN İ.  
10th International Conference on Electrical and Electronics Engineering (ELECO), 30 November - 02 December 2017
- XXI. **Differential Microwave Imaging of the Stroke-affected Brain via Diffraction Tomography**  
Dilman İ., Akıncı M. N., Çayören M., Akduman İ.  
25th Telecommunication Forum (TELFOR), Belgrade, Serbia And Montenegro, 21 - 22 November 2017, pp.444-447
- XXII. **Hemorrhagic Brain Strokes Detection via Microwave Surface Impedance Method**  
AKDUMAN İ., ERDEM N., güren o.  
PIERS 2017, 19 - 22 November 2017
- XXIII. **Matching medium characterization for microwave brain stroke imaging**  
Yilmaz T., Eken G., Yildirim E., Acar M., Akduman İ.

253rd National Meeting of the American-Chemical-Society (ACS) on Advanced Materials, Technologies, Systems, and Processes, San-Francisco, Costa Rica, 2 - 06 April 2017, vol.253

- XXIV. **Continuous Monitoring of Hemorrhagic Brain Strokes via Contrast Source Inversion**  
Yıldırım U., Dilman I., Bilgin E., Doğu S., Çayören M., Akduman İ.  
11th European Conference on Antennas and Propagation (EUCAP), Paris, France, 19 - 24 March 2017, pp.408-411
- XXV. **Feasibility of brain stroke imaging with microwaves**  
Dilman I., Yıldırım U., Coşğun S., Doğu S., Çayören M., Akduman İ.  
7th IEEE Asia-Pacific Conference on Applied Electromagnetics, APACE 2016, Langkawi, Kedah, Malaysia, 11 - 13 December 2016, pp.334-338
- XXVI. **Log-Periodic Dipole Array Antenna Design for Microwave Imaging Applications**  
Uyanık C., Yıldız M. O., Doğu S., Ertay A. O., Akduman İ.  
National Conference on Electrical, Electronics and Biomedical Engineering (ELECO), Bursa, Turkey, 1 - 03 December 2016, pp.554-557
- XXVII. **Mikrodalga Görüntüleme Uygulamalar için Log-Periyodik Dipol Anten Dizisi Tasarımı**  
Uyanık C., Yıldız M. Ö., Doğu S., Ertay A. O., Akduman İ.  
Elektrik - Elektronik ve Biyomedikal Mühendisliği Konferansı 2016, Bursa, Turkey, 1 - 03 December 2016, pp.554-557
- XXVIII. **Design of Slotted Vivaldi Antenna for Microwave Imaging Applications**  
Uyanık C., Dalgıç O., Ertay A. O., Doğu S., Çayören M., Akduman İ.  
National Conference on Electrical, Electronics and Biomedical Engineering (ELECO), Bursa, Turkey, 1 - 03 December 2016, pp.547-549
- XXIX. **Mikrodalga Görüntüleme Uygulamalar için Oluklu Vivaldi Anten Tasarımı**  
Uyanık C., Dalgıç Ö., Ertay A. O., Doğu S., Çayören M., Akduman İ.  
Elektrik - Elektronik ve Biyomedikal Mühendisliği Konferansı 2016, Bursa, Turkey, 1 - 03 December 2016, pp.547-549
- XXX. **A coplanar vivaldi antenna design with improved frequency response for microwave breast imaging**  
Uyanık C., Ertay A. O., Doğu S., Akduman İ., ŞAHİNTÜRK H.  
2016 IEEE Conference on Antenna Measurements and Applications, CAMA 2016, New-York, United States Of America, 23 - 27 October 2016
- XXXI. **Matching Medium Characterization for Microwave Brain Stroke Imaging**  
Yılmaz T., ŞAHİNTÜRK H., Acar M., Akduman İ.  
IEEE-Antennas-and-Propagation-Society International Symposium, Fajardo, Puerto Rico, 26 June - 01 July 2016, pp.1485-1486
- XXXII. **Dielectric Property Measurements of Dextrose Solutions for RF Sensor Design**  
Cakmak K., Ozturk T., Yılmaz T., Akduman İ.  
IEEE/ACES International Conference on Wireless Information Technology (ICWITS) and System and Applied Computational Electromagnetics (ACES), Hawaii, United States Of America, 13 - 17 March 2016
- XXXIII. **A Comparison of Range Test Method-Linear Sampling Method for Microwave Imaging**  
Özgür S., Abbak M., Akduman İ.  
20th Telecommunications Forum (TELFOR), Belgrade, Serbia And Montenegro, 24 - 26 November 2015, pp.575-578
- XXXIV. **Shorted Stacked Antenna with Folded Feed for Microwave Detection of Brain Stroke**  
Abbak M., Özgür S., Akduman İ.  
20th Telecommunications Forum (TELFOR), Belgrade, Serbia And Montenegro, 24 - 26 November 2015, pp.603-606
- XXXV. **Analysis of Matching Media Effect on Microwave Brain Stroke Imaging via a Spherically Symmetrical Head Model**  
BİLGİN E., YAPAR A., AKDUMAN İ., aygün a.  
PIERS Progress In Electromagnetics Research Symposium, 6 - 09 July 2015
- XXXVI. **New imaging technique for breast carcinoma Cerrahpasa experience Preliminary Report**  
ÖZCAN M., ÇAYÖREN M., ARIKAN A. E., KILIÇ M. A., TEKSÖZ S., FERAHMAN S., AKDUMAN İ., TUNAYA K.

8th annual meeting of Chinese College of Surgeons and 19th annual meeting of the European Society of Surgery, 15 - 17 May 2015

**XXXVII. Experimental Comparison of Qualitative Inverse Scattering Methods**

Akncı M. N., Abbak M., Özgür S., Çayören M., Akduman İ.

IEEE Conference on Antenna Measurements and Applications (CAMA), Antibes, France, 16 - 19 November 2014

**XXXVIII. Miniaturized Tapered Slot Antenna for Microwave Breast Imaging**

Abbak M., Akduman İ.

20th Telecommunications Forum, Belgrade, Serbia And Montenegro, 20 - 22 November 2012, pp.1214-1216

**XXXIX. A Novel Broadband and High Gain Antenna for GSM, UMTS, and LTE Wi-MAX Applications**

Abbak M., Karakus C., Akduman İ.

4th European Conference on Antennas and Propagation (EuCAP), Barcelona, Spain, 12 - 16 April 2010

**XL. ACCREDITATION IN TURKISH UNIVERSITIES**

Yalcin D., Senel S., Akduman İ.

8th International Scientific Conference on Modern Management of Mine Producing, Geology and Environmental Protection, Sofija, Bulgaria, 16 - 20 June 2008, pp.631-632

**XLI. Numerical computation of the Green's function of a layered media with rough interfaces**

Altuncu Y., Akduman İ., Özdemir Ö., Yapar A.

7th International Symposium on Antennas, Propagation and EM Theory, Guilin, China, 26 - 29 October 2006, pp.1024-1027

**XLII. Imaging of dielectric objects buried under an arbitrary rough surface**

Altuncu Y., Özdemir Ö., Akduman İ., Yapar A.

IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Colorado, United States Of America, 31 July - 04 August 2006, pp.2969-2972

## Supported Projects

Akduman İ., Project Supported by Higher Education Institutions, Mikrodalga Meme Görüntülemesi İçin Gelişmiş Frekans Cevaplı Koplanar Vivaldi Anteni Tasarımı, 2016 - 2018

Akduman İ., Project Supported by Higher Education Institutions, Sürekli Dalga GPR ile Yer Altına Gömülü Cisimleri Dedeksiyonu Yerlerinin Tespiti ve Ayırt Edilmesi, 2012 - 2018

Akduman İ., Project Supported by Higher Education Institutions, KONTRAST KAYNAK YÖNETİMİ İLE DUVAR ARKASI GÖRÜNTÜLEME DENEYSEL SONUÇLAR, 2011 - 2018

Akduman İ., Project Supported by Higher Education Institutions, ENGEBELİ BİR YÜZEY ALTINA GÖMÜLÜ CİSİMLERİN DENEYSEL VERİLERLE DEDEKSİYONU VE GÖRÜNTÜLENMESİ, 2010 - 2018

Akduman İ., Project Supported by Higher Education Institutions, elektromagnetik kaynakların alan ölçümleri aracılığı ile belirlenmesi, 2009 - 2018

Akduman İ., Project Supported by Higher Education Institutions, Gömülü Cisimlerin Yüzey Empedansı Aracılığı ile Belirlenmesi, 2003 - 2004

Akduman İ., Project Supported by Higher Education Institutions, Yüksek Öğretimde Öğrencilerin Sosyal-Ekonomik Özelliklerinin Başarı Düzeyine Etkisi, 1999 - 2000

## Metrics

Publication: 112

Citation (WoS): 711

Citation (Scopus): 1013

H-Index (WoS): 17

H-Index (Scopus): 19

## **Non Academic Experience**

MİTOS Mikrodalga Görüntüleme Sistemleri Mühendislik San. Tic. Ltd.

MITOS Medikal Sistemler San. Tic. A.Ş.

FP 6 Programı

University of Goettingen, Almanya

New Jersey Institute of Technology

King's College London

New York Polytechnic University