

## DAFTAR PUSTAKA

- [1] A. S. Mohammed *et al.*, “Microstrip patch antenna: A review and the current state of the art,” *J. Adv. Res. Dyn. Control Syst.*, vol. 11, no. 7, pp. 510–524, 2019.
- [2] Z. N. Fikana, A. A. Pramudita, and L. O. Nur, “Perancangan antena mikrostrip sebagai sensor deteksi kadar air pada jagung,” *EProceedings Eng.*, vol. 10, no. 3, pp. 1–9, 2023.
- [3] R. C. Mahajan and V. Vyas, “Wideband microstrip antenna for the detection of solutes in water,” *Eng. Rep.*, vol. 3, no. 7, pp. 1–11, 2021.
- [4] A. Karatepe *et al.*, “Multipurpose chemical liquid sensing applications by microwave approach,” *PloS One*, vol. 15, no. 5, pp. 1–15, 2020.
- [5] M. H. Alrashdan, Z. Al-qudah, and M. Al Bataineh, “Microstrip patch antenna directivity optimization via Taguchi method,” *Ain Shams Eng. J.*, vol. 15, no. 9, pp. 1–13, 2024.
- [6] L. A. Didik, “Pengaruh Pemberian Medan Magnet Terhadap Konstanta Dielektrik Material AgCrO<sub>2</sub>,” *Konstan*, vol. 2, no. 1, pp. 1–5, 2016.
- [7] C. Lo Vecchio, E. Mosca, S. Trocino, and V. Baglio, “Investigation of an ethanol electroreforming cell based on a Pt<sub>1</sub>Ru<sub>1</sub>/C catalyst at the anode,” *Catalysts*, vol. 14, no. 7, pp. 1–12, 2024.
- [8] T. K. Dandasena and S. Shahi, “A Renewable Biofuel-Bioethanol: A Review,” *J. Adv. Zool.*, vol. 44, no. S3, pp. 1698–1706, 2023.
- [9] M. D. Laksitorini, L. U. Suryani, F. R. Muhammad, and H. Purnomo, “Application of Hildebrand Solubility Parameter to Identify Ethanol-Free Co-Solvent for Pediatric Formulation.,” *Indones. J. PharmacyMajalah Farm. Indones.*, vol. 34, no. 2, pp. 218–226, 2023.
- [10] O. I. Christianah, “Alcoholic Beverages and Human Health: An Overview,” in *Frontiers and New Trends in the Science of Fermented Food and Beverages*, IntechOpen, 2018. doi: 10.5772/intechopen.81054.
- [11] M. Arslan *et al.*, “Recent trends in quality control, discrimination and authentication of alcoholic beverages using nondestructive instrumental techniques,” *Trends Food Sci. Technol.*, vol. 107, pp. 80–113, 2021.
- [12] V. Navarkhele, “Dielectric relaxation study of binary mixtures at different temperatures,” *Int J Pharm Pharm Sci*, vol. 8, no. 9, pp. 102–106, 2016.
- [13] N. Musa, M. Onimisi, and J. Ikyumbur, “Frequency and temperature dependence of ethanol using the Cole–Cole relaxation model,” *Am. J. Condens. Matter Phys.*, vol. 10, no. 2, pp. 44–49, 2020.
- [14] S. A. Qureshi, Z. Z. Abidin, H. A. Majid, A. Y. Ashyap, and C. H. See, “Detection of ethanol concentration in liquid using a double-layered resonator

- operating at 5G-mm-wave frequencies,” *J. Electron. Mater.*, vol. 51, no. 12, pp. 7028–7036, 2022.
- [15] Z. Hafdi, J. Tao, and A. Chaabi, “Microstrip coupled high sensitivity sensor for water ethanol mixture characterization,” *Frequenz*, vol. 75, no. 1–2, pp. 1–7, 2021.
- [16] A. J. A. Al-Gburi, N. A. Rahman, Z. Zakaria, and M. F. Akbar, “Realizing the high Q-factor of a CSIW microwave resonator based on an MDGS for semisolid material characterization,” *Micromachines*, vol. 14, no. 5, pp. 1–30, 2023.
- [17] A. Kumar and S. Raghavan, “A review: substrate integrated waveguide antennas and arrays,” *J. Telecommun. Electron. Comput. Eng. JTEC*, vol. 8, no. 5, pp. 95–104, 2016.
- [18] N. S. Khair, N. A. T. Yusof, Y. A. Wahab, B. S. Bari, N. I. Ayob, and M. Zolkapli, “Substrate-integrated waveguide (SIW) microwave sensor theory and model in characterising dielectric material: A review,” *Sens. Int.*, vol. 4, no. 100244, pp. 1–10, 2023.
- [19] Y. Seo, M. U. Memon, and S. Lim, “Microfluidic eighth-mode substrate-integrated-waveguide antenna for compact ethanol chemical sensor application,” *IEEE Trans. Antennas Propag.*, vol. 64, no. 7, pp. 3218–3222, 2016.
- [20] J. D. Barrera and G. H. Huff, “Analysis of a variable SIW resonator enabled by dielectric material perturbations and applications,” *IEEE Trans. Microw. Theory Tech.*, vol. 61, no. 1, pp. 225–233, 2012.
- [21] E. Silavwe, N. Somjit, and I. D. Robertson, “A microfluidic-integrated SIW lab-on-substrate sensor for microliter liquid characterization,” *IEEE Sens. J.*, vol. 16, no. 21, pp. 7628–7635, 2016.
- [22] A. A. Mohd Bahar, Z. Zakaria, M. Md. Arshad, A. Isa, Y. Dasril, and R. A. Alahnomi, “Real time microwave biochemical sensor based on circular SIW approach for aqueous dielectric detection,” *Sci. Rep.*, vol. 9, no. 1, pp. 1–12, 2019.
- [23] A. H. Rambe, “Antena Mikrostrip: Konsep dan Aplikasinya,” *JiTEKH*, vol. 1, no. 1, pp. 86–92, 2012.
- [24] S. P. Santosa, *Antena Mikrostrip Segitiga dengan Saluran Pencatu Berbentuk Garpu yang Dikopel Secara Elektromagnetik*. Laporan Tugas Akhir Teknik Telekomunikasi Universitas Indonesia, 2008.
- [25] M. Fadhil, L. O. Nur, and H. H. Ryanu, “Perancangan Dan Analisis Antena Mikrostrip Patch Circular Ring Dengan Menggunakan Csrr Di Sisi Ground Plane Pada Frekuensi 3, 5 Ghz,” *E-Proceeding Eng.*, vol. 10, no. 5, pp. 4265–4271, 2023.
- [26] C. A. Balanis, *Antenna theory: analysis and design*, 4 th. Canada: John wiley & sons, 2015.

- [27] E. Y. D. Utami, F. D. Setaiji, and D. Pebrianto, “Rancang Bangun Antena Mikrostrip Persegi Panjang 2,4 GHz untuk Aplikasi Wireless Fidelity (Wi-Fi),” *J. Nas. Tek. ELEKTRO*, vol. 6, no. 3, pp. 196–202, Nov. 2017, doi: 10.25077/jnte.v6n3.406.2017.
- [28] B. W. Ziliwu, “The Antena Mikrostrip Bentuk Persegi, 2 Patch Dan 2 Array Untuk Jaringan Wi-Max Pada Frekuensi (3, 2-3, 4) MHz,” *Akselerator J. Sains Terap. Dan Teknol.*, vol. 1, no. 1, pp. 1–10, 2020.
- [29] S. Basu, A. Srivastava, and A. Goswami, “Dual frequency hexagonal microstrip patch antenna,” *Int. J. Sci. Res. Publ.*, vol. 3, no. 11, pp. 1–9, 2013.
- [30] V. Prakasam and N. Reddy, “Hexagonal shaped micro-strip patch antenna design for 2.45 GHz WLAN system,” presented at the 2021 6th International Conference on Inventive Computation Technologies (ICICT), IEEE, 2021, pp. 13–18.
- [31] S. Latifah and H. Madiawati, “Antena Mikrostrip Circular Patch untuk Aplikasi Radar Altimeter pada Frekuensi C-Band Menggunakan Metode Parasitik,” *J. Tek. Media Pengemb. Ilmu Dan Apl. Tek.*, vol. 21, no. 2, pp. 106–114, 2022.
- [32] F. Fitrialina, J. Haidi, A. Surapati, H. Santosa, and R. Fernandez, “Microstrip Rectangular Patch Array Antenna for Tsunami Radar,” *J. Nas. Tek. Elektro*, vol. 11, no. 2, pp. 97–104, 2022.
- [33] S. M. Putri, “Analisis Antena Mikrostrip Fraktal Sierpinski Gasket MIMO,” *J. Elektro Dan Telkomunikasi*, vol. 4, no. 2, pp. 55–61, 2017.
- [34] Y. J. Cheng, *Substrate integrated antennas and arrays*. London: CRC Press, 2018.
- [35] M. Bozzi, “Substrate integrated waveguide (SIW): An emerging technology for wireless systems,” presented at the 2012 Asia Pacific Microwave Conference Proceedings, IEEE, 2012, pp. 788–790.
- [36] M. Kent, “The use of strip-line configuration in microwave moisture measurements II,” *J. Microw. Power*, vol. 8, no. 2, pp. 189–194, 1973.
- [37] M. U. Memon and S. Lim, “Review of reconfigurable substrate-integrated-waveguide antennas,” *J. Electromagn. Waves Appl.*, vol. 28, no. 15, pp. 1815–1833, 2014.
- [38] M. Bozzi, A. Georgiadis, and K. Wu, “Review of substrate-integrated waveguide circuits and antennas,” *IET Microw. Antennas Propag.*, vol. 5, no. 8, pp. 909–920, 2011.
- [39] H. P. Suseno, “Pemanfaatan bonggol jagung sebagai bioetanol,” *J. Teknol. Technoscientia*, vol. 12, no. 1, pp. 85–92, 2019.
- [40] W. Wusnah, S. Bahri, and D. Hartono, “Proses pembuatan bioetanol dari kulit pisang kepok (*Musa acuminata* BC) secara fermentasi,” *J. Teknol. Kim. Unimal*, vol. 8, no. 1, pp. 48–56, 2020.
- [41] W. Braide, I. Oji, S. Adeleye, and M. Korie, “Comparative study of bioethanol production from agricultural wastes by *Zymomonas mobilis* and

- Saccharomyces cerevisiae,”* *Int. J. Appl. Microbiol. Biotechnol. Res.*, vol. 6, no. 2, pp. 50–60, 2018.
- [42] S. Taneja, A. Jain, and Y. Bhadoriya, “Green hydrogen as a clean energy resource and its applications as an engine fuel,” *Eng. Proc.*, vol. 59, no. 1, pp. 1–10, 2024.
- [43] F. Mathew and A. Goyal, “Ethanol,” in *StatPearls*, Treasure Island (FL): StatPearls Publishing, 2025. Accessed: Jun. 17, 2025. [Online]. Available: <http://www.ncbi.nlm.nih.gov/books/NBK556147/>
- [44] T. Pham *et al.*, “Gaseous environments modify physiology in the brewing yeast *Saccharomyces cerevisiae* during batch alcoholic fermentation,” *J. Appl. Microbiol.*, vol. 105, no. 3, pp. 858–874, 2008.
- [45] J. Yeo and J.-I. Lee, “High-Sensitivity Microstrip Patch Sensor Antenna for Detecting Concentration of Ethanol-Water Solution in Microliter Volume,” *J. Adv. Navig. Technol.*, vol. 26, no. 6, pp. 510–515, 2022.
- [46] F. Mathew and A. Goyal, “Ethanol,” 2020.
- [47] P. Martinez, W. C. Kerr, M. S. Subbaraman, and S. C. Roberts, “New estimates of the mean ethanol content of beer, wine, and spirits sold in the United States show a greater increase in per capita alcohol consumption than previous estimates,” *Alcohol. Clin. Exp. Res.*, vol. 43, no. 3, pp. 509–521, 2019.
- [48] M. Vasiljevic, D.-L. Couturier, and T. M. Marteau, “Impact on product appeal of labeling wine and beer with (a) lower strength alcohol verbal descriptors and (b) percent alcohol by volume (% ABV): An experimental study.,” *Psychol. Addict. Behav.*, vol. 32, no. 7, pp. 779–791, 2018.
- [49] M. Mohsen-Nia, H. Amiri, and B. Jazi, “Dielectric constants of water, methanol, ethanol, butanol and acetone: measurement and computational study,” *J. Solut. Chem.*, vol. 39, pp. 701–708, 2010.
- [50] T. W. Irianti, “Perbandingan Variasi Konsentrasi Sabun Cuci Piring Terhadap Kualitas Pewarnaan Hematoksilin Eosin Pada Tahap Deparafinasi,” *J. MUHAMMADIYAH Med. Lab. Technol.*, vol. 7, no. 1, pp. 54–65, 2024.
- [51] H. Wen and Y. Hsu, “The Nanosilver Imprinted Cross-Channel Film used in Microfluidic Chips Based on Microcavity Resonator for Mercury Assessment,” *Adv. Sens. Res.*, vol. 3, no. 4, pp. 1–12, 2024.
- [52] J. Kustija, *Modul Sensor dan Tranducer*. 2012. Accessed: Apr. 14, 2025. [Online]. Available: <https://jajakustija.wordpress.com/wp-content/uploads/2014/08/modul-sensor-dan-transduser2.pdf>
- [53] P. N. Nge, C. I. Rogers, and A. T. Woolley, “Advances in microfluidic materials, functions, integration, and applications,” *Chem. Rev.*, vol. 113, no. 4, pp. 2550–2583, 2013.
- [54] A. S. Morris, “Measurement and instrumentation principles,” *Meas. Sci. Technol.*, vol. 12, no. 10, pp. 1743–1744, 2001.

- [55] A. Saputra, J. Junaidi, A. Supriyanto, and A. Surtono, “Desain dan Realisasi Alat Ukur Massa (Neraca Digital) Menggunakan Sensor Load Cell Berbasis Arduino,” *J. Teori Dan Apl. Fis.*, vol. 10, no. 02, pp. 159–168, 2022.
- [56] P. F. Yudha and R. A. Sani, “Implementasi Sensor Ultrasonik Hc-Sr04 Sebagai Sensor Parkir Mobil Berbasis Arduino,” *Einstein E-J.*, vol. 5, no. 3, pp. 19–26, 2019.
- [57] S. Njokweni and P. Kumar, “Salt and sugar detection system using a compact microstrip patch antenna,” *Int. J. Smart Sens. Intell. Syst.*, vol. 13, no. 1, pp. 1–9, 2020.
- [58] Z. N. Fikana, A. A. Pramudita, and L. O. Nur, “Perancangan antena mikrostrip sebagai sensor deteksi kadar air pada jagung,” *EProceedings Eng.*, vol. 10, no. 3, 2023.
- [59] M. Nasir, “Perbandingan Teknologi WiMax dengan Wi-Fi,” *J. Ilm. MATRIK*, vol. 15, no. 1, pp. 43–52, 2013.
- [60] Y. Yusantono, “Analisis dan Perbandingan Jaringan WiFi dengan frekuensi 2.4 GHz dan 5 GHz dengan Metode QoS,” *J. Inf. Syst. Technol. Jt.*, vol. 1, no. 1, pp. 34–52, 2020.
- [61] *Recommendation ITU-R SM.1896-1 - Frequency ranges for global or regional harmonization of short-range devices*, 2018.
- [62] A. M. A. Rusdy, P. Purnawansyah, and H. Herman, “Penerapan Metode Regresi Linear Pada Prediksi Penawaran dan Permintaan Obat Studi Kasus Aplikasi Point Of Sales,” *Bul. Sist. Inf. Dan Teknol. Islam*, vol. 3, no. 2, pp. 121–126, 2022.
- [63] Solidwork, “Simulia CST Studio Suite Fitur terbaru 2021.” Accessed: Apr. 14, 2025. [Online]. Available: <https://arismadata.com/solidworks/blog/2021/09/simulia-cst-studio-suite-fitur-terbaru-2021/>
- [64] M. Wibowo, “Pemodelan Statistik Hubungan Debit dan Kandungan Sedimen Sungai,” *J. Teknol. Lingkung.*, vol. 2, no. 3, pp. 255–260, 2001.
- [65] S. Bardja, “Pengaruh Penerapan Senam Hook Ups Terhadap Tingkat Percaya Diri Anak Kelas Dua Min Guwa Kidul,” *J. Ilm. Indones.*, vol. 2, no. 12, pp. 112–122, 2017.
- [66] F. Pritama, E. R. D. Leluni, and J. Parhusip, “Analisis Distribusi Kinerja SVM dan KNN Berdasarkan Rata Rata Simpangan Baku dan Stabilitas,” *Informatech J. Ilm. Inform. Dan Komput.*, vol. 1, no. 2, pp. 170–174, 2024.
- [67] A. Setiawan, “Perbandingan koefisien variasi antara 2 sampel dengan metode bootstrap,” *DCartesian J. Mat. Dan Apl.*, vol. 1, no. 1, pp. 18–24, 2012.
- [68] K. Santoso, “Pengaruh Pemakaian Setengah Volume Sampel Dan Reagen Pada Pemeriksaan Glukosa Darah Metode God-Pap Terhadap Nilai Simpangan Baku Dan Koefisien Variasi,” *J. Wiyata Penelit. Sains Dan Kesehat.*, vol. 2, no. 2, pp. 114–119, 2017.