

# Horn Antennas

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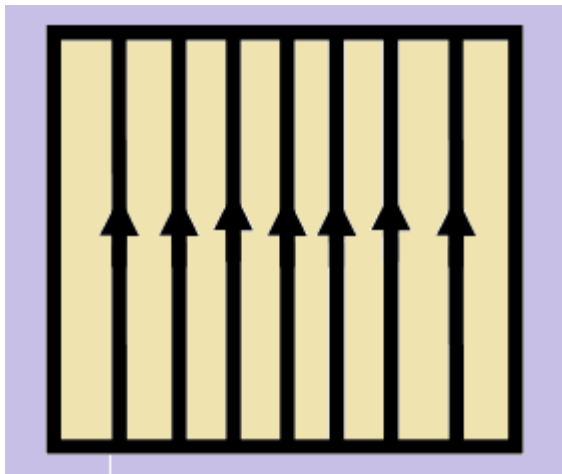
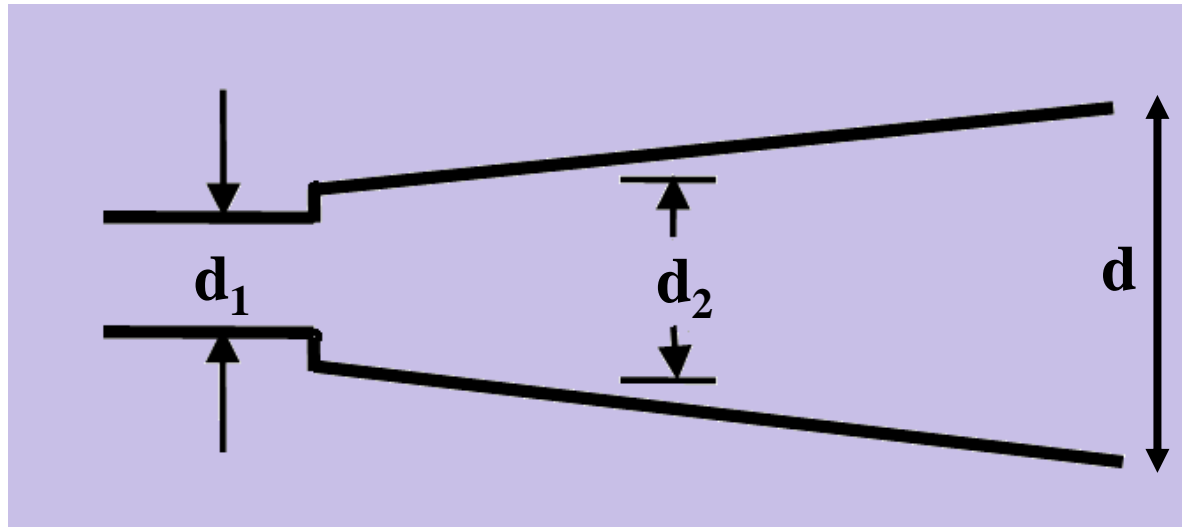
**Prof. Girish Kumar**

Electrical Engineering Department, IIT Bombay

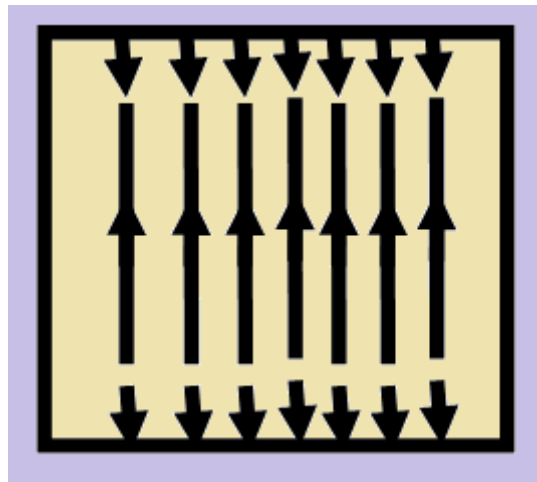
[gkumar@ee.iitb.ac.in](mailto:gkumar@ee.iitb.ac.in)

(022) 2576 7436

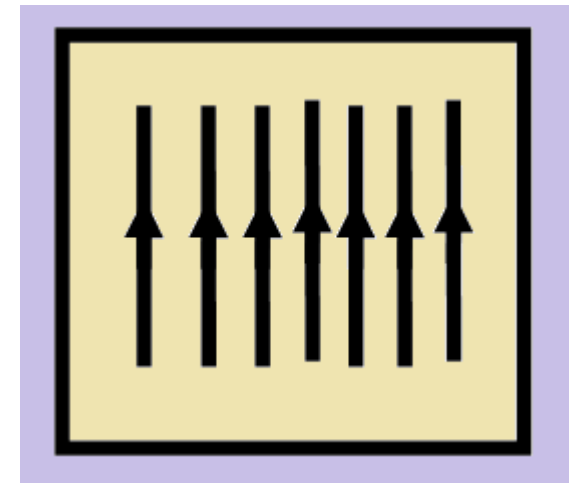
# Dual Mode Pyramidal Horn Antenna



$TE_{10}$

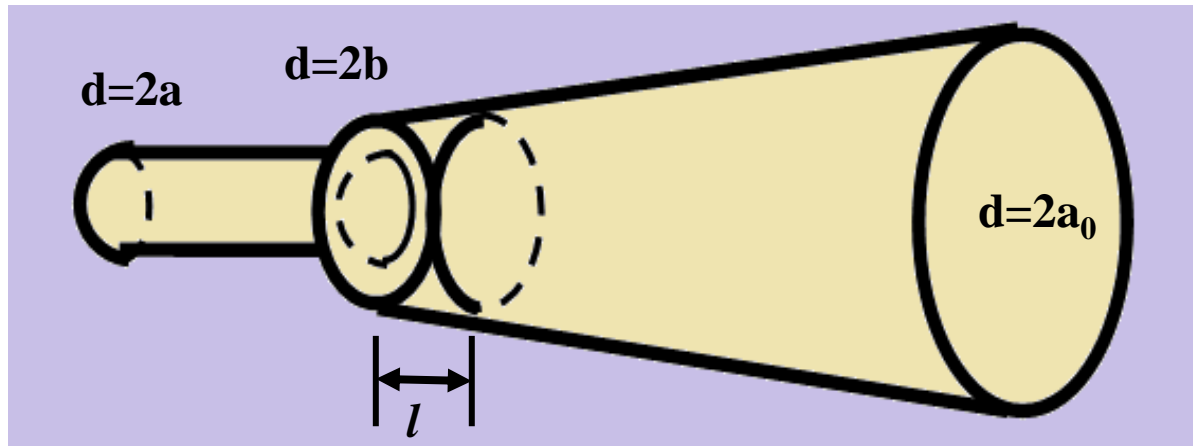


$TE_{12}/TM_{12}$



Multimode

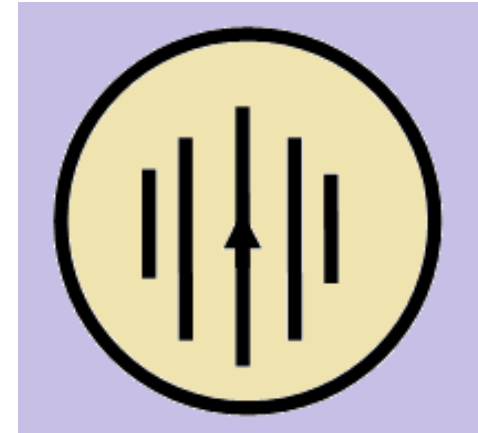
# Dual Mode Conical Horn Antenna



$TE_{11}$

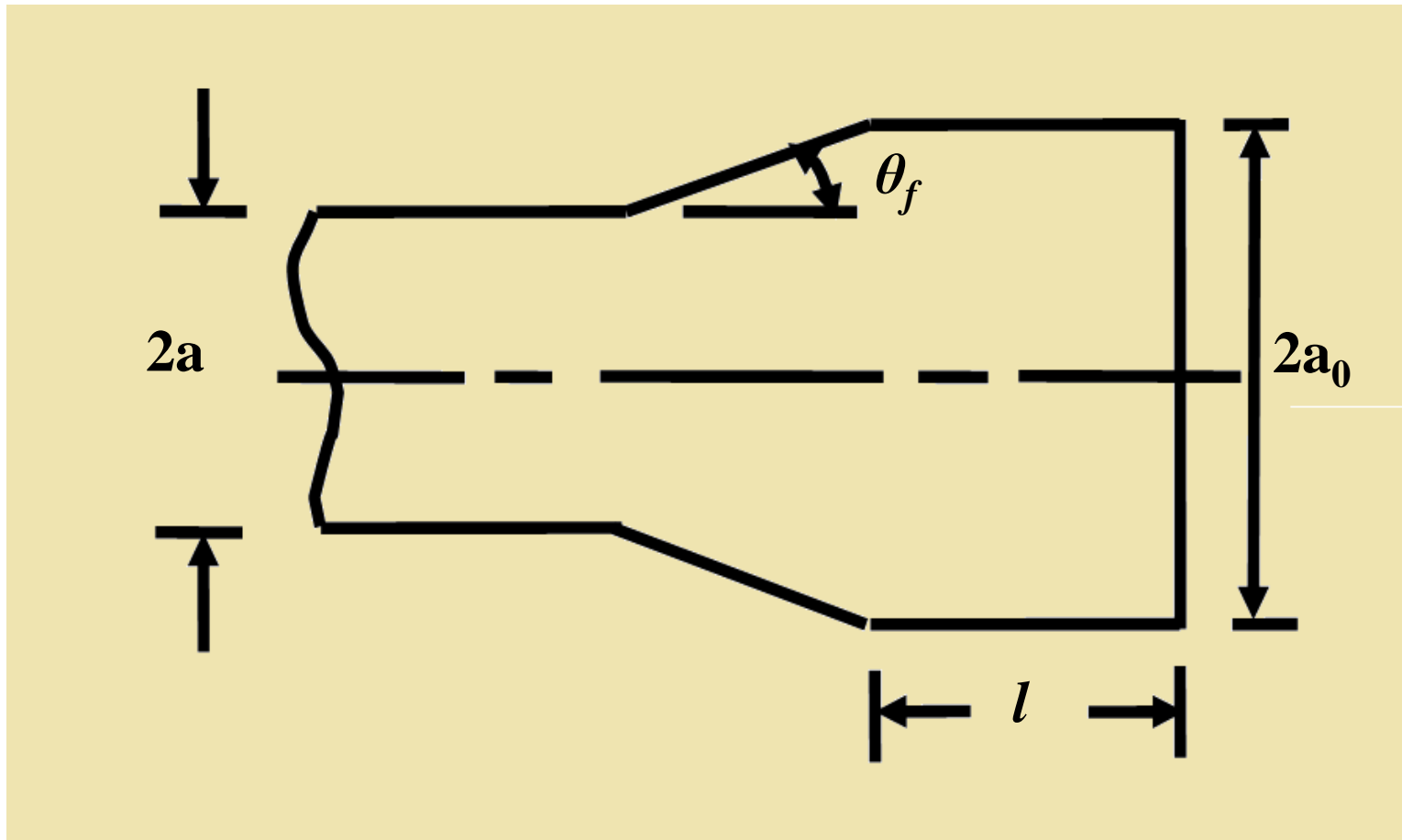


$TM_{11}$

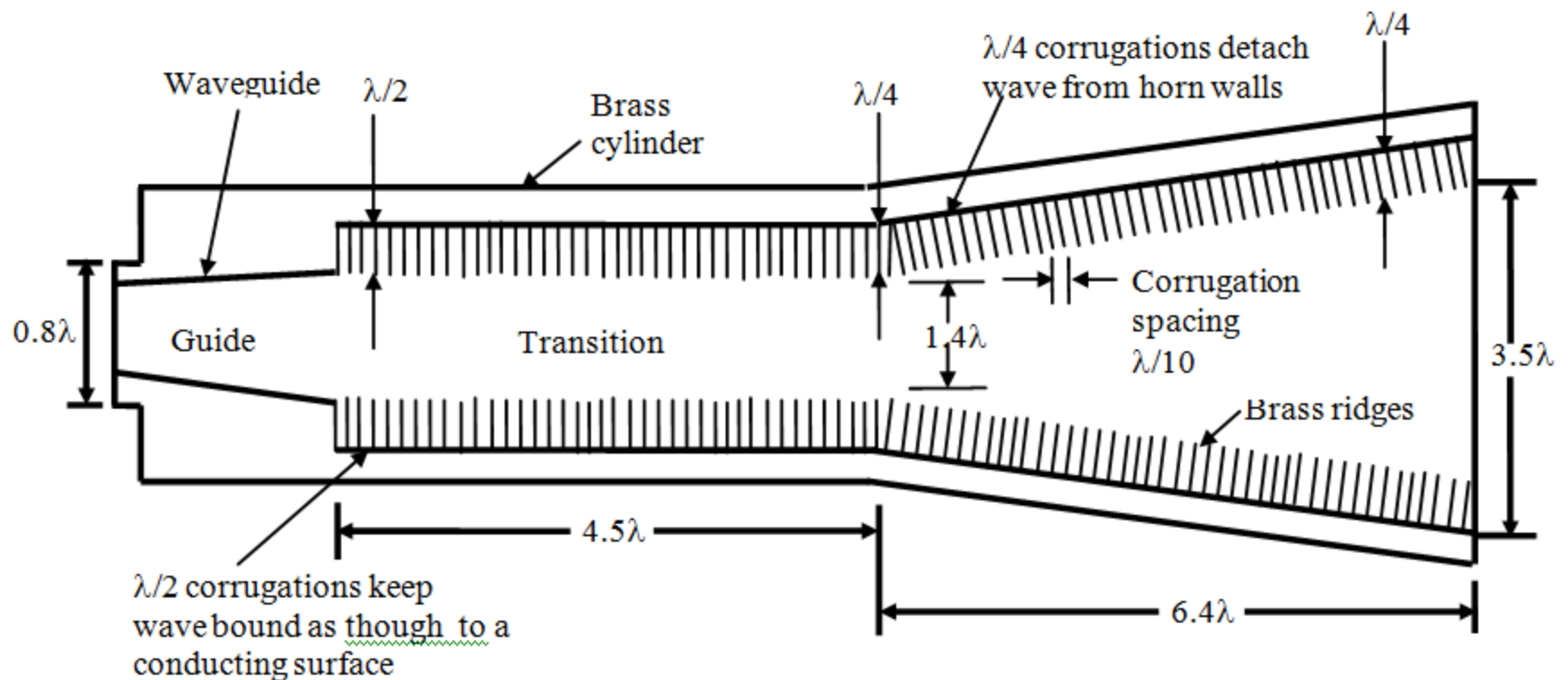


Dual Mode

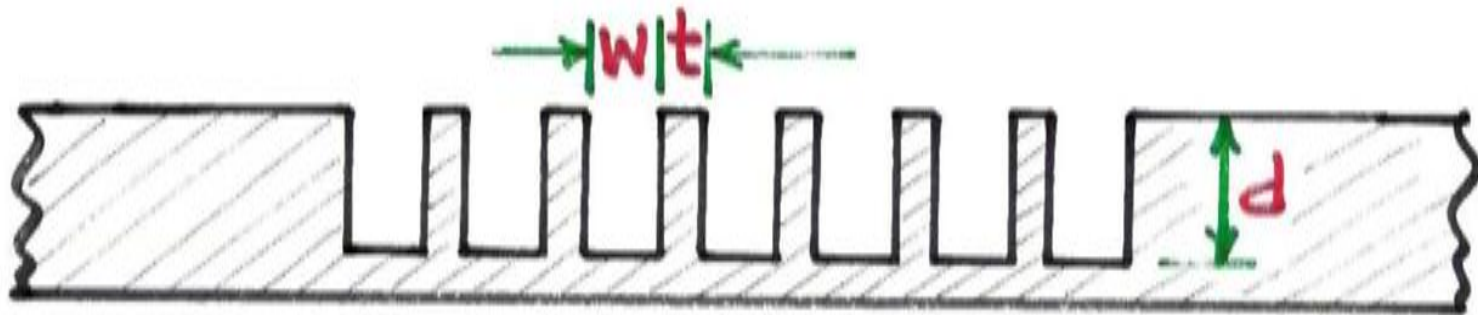
# Step-Less Dual Mode Conical Horn



# Circular Corrugated Horn Antenna



# Corrugated Surface



**Typical Values of  $d$ , No. of Teeth,  $w$  and  $t$ :**

**Depth of the gap ( $d$ ) =  $0.25\lambda$  to  $0.5\lambda$**

**No. of Teeth ( $n$ ) = 4 to 10 per  $\lambda$**

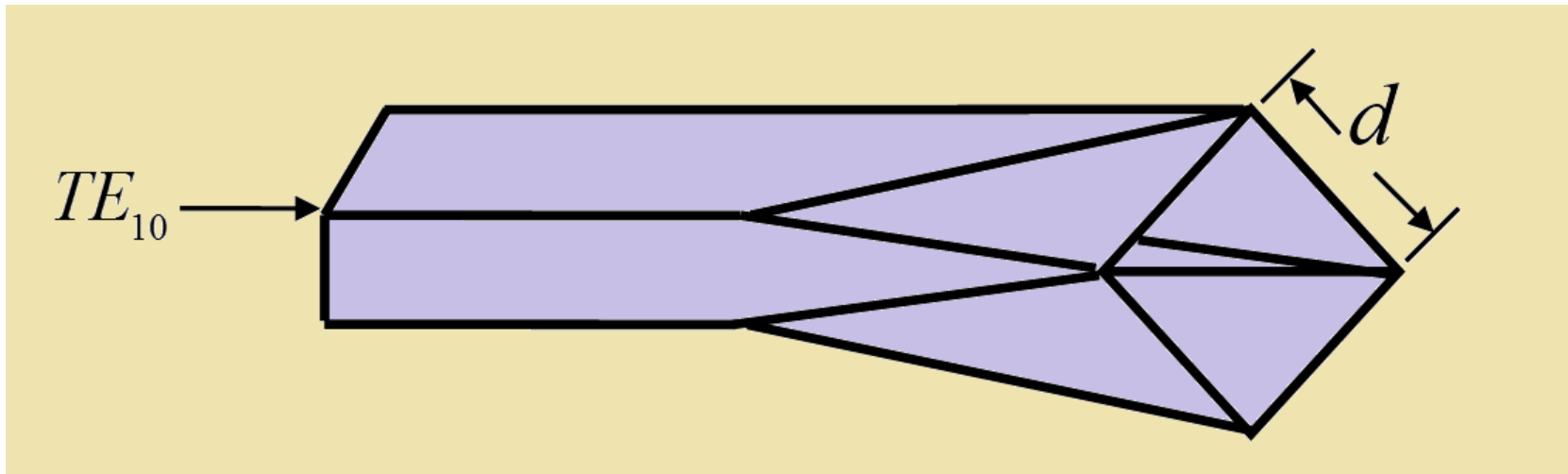
**Width of the gap ( $w$ ) =  $0.05\lambda$  to  $0.2\lambda$**

**Teeth thickness ( $t$ ) =  $0.02\lambda$  to  $0.1\lambda$**

# Corrugated Conical Horn



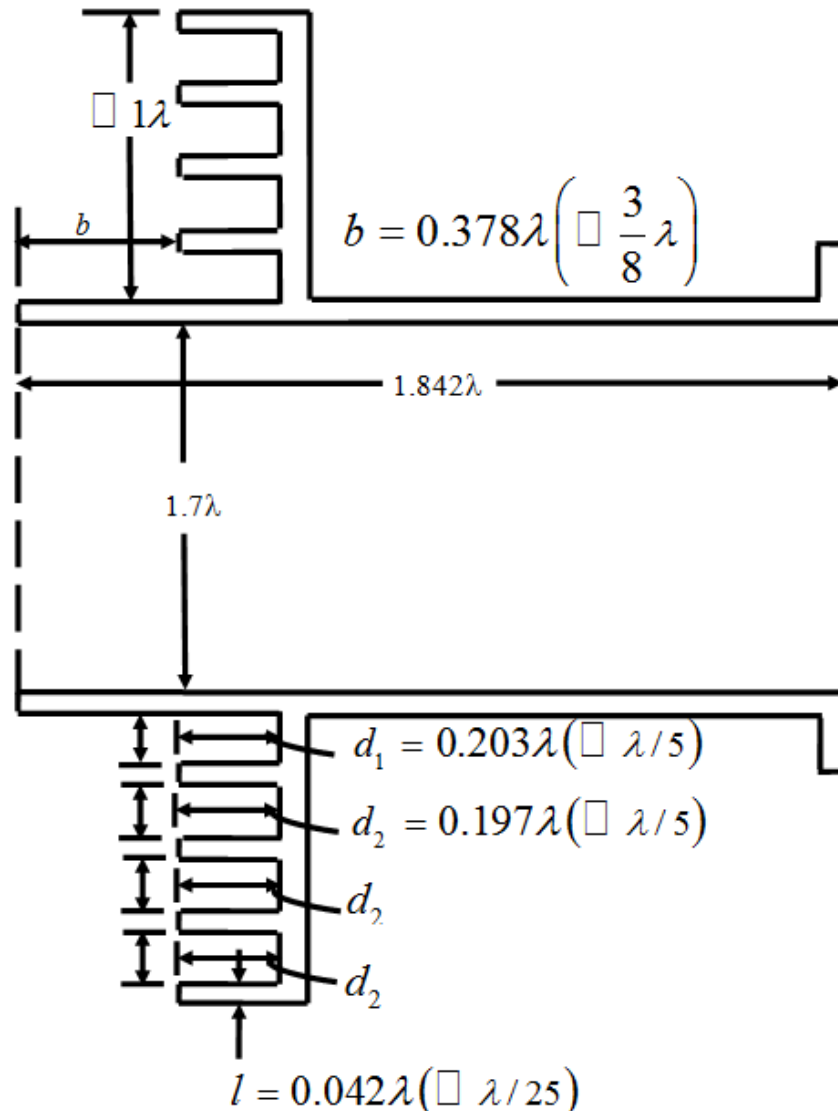
# Multimode Horn Antenna



**$TE_{10}$  and  $TE_{01}$** : Excited with Equal Amplitude and Phase in a square waveguide

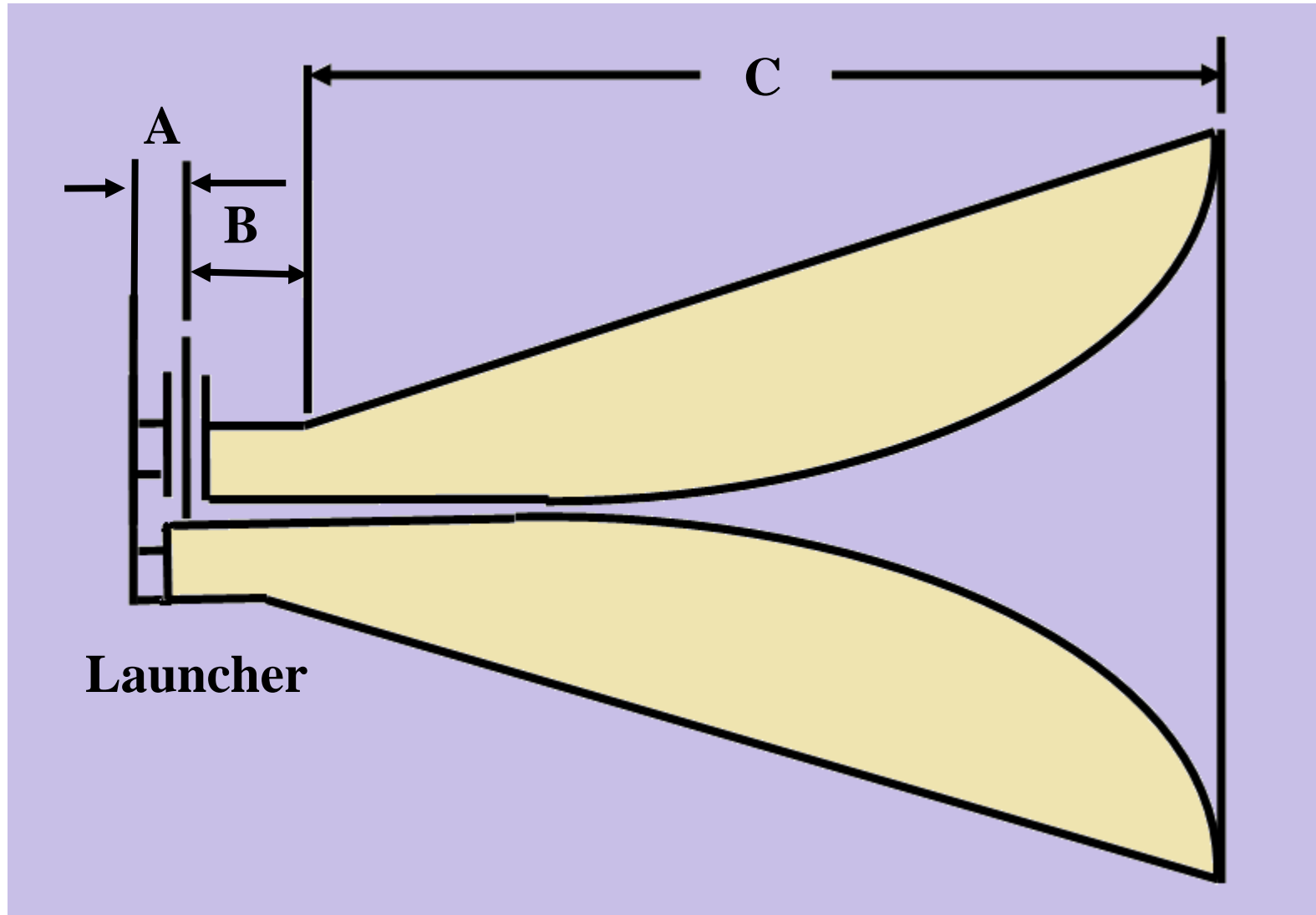


# Circular Waveguide with Flange

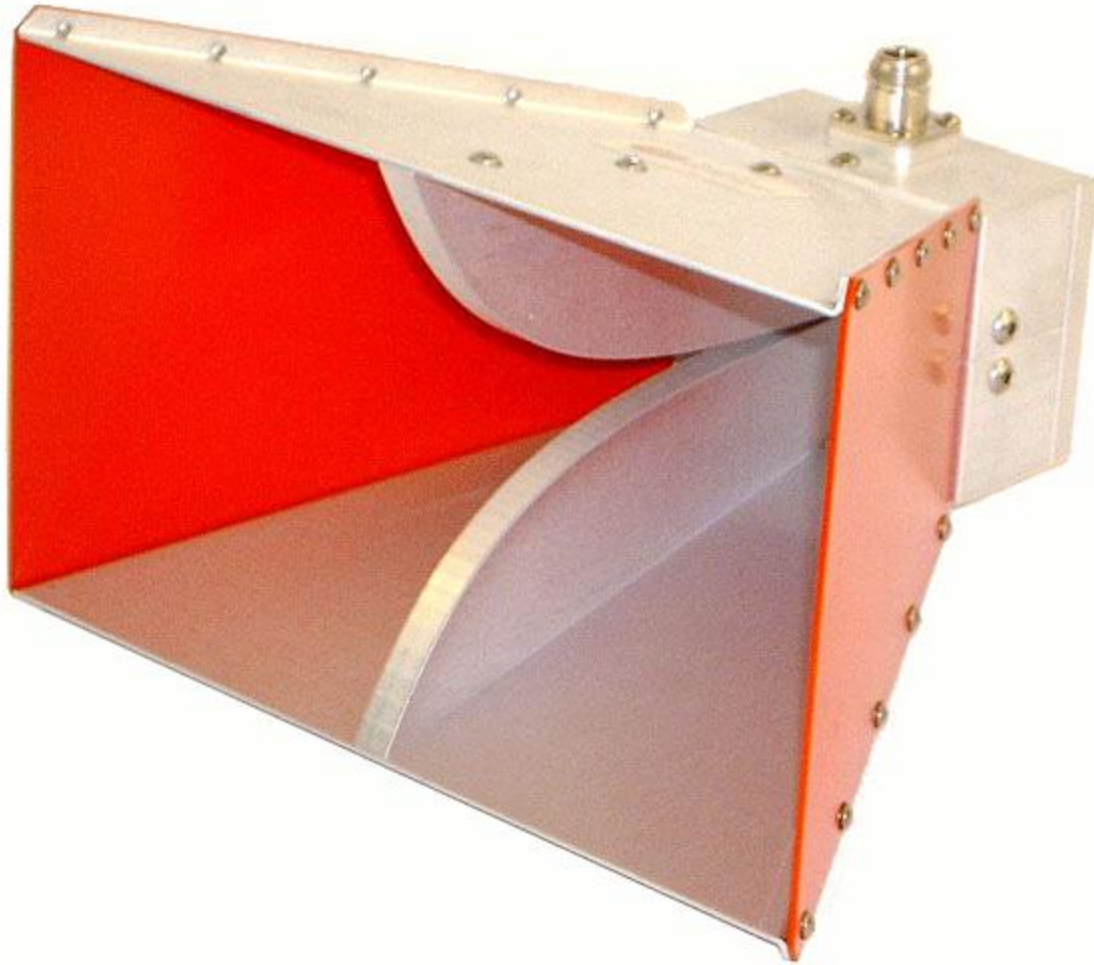


Circular waveguide with flange and 4 chokes for wide-beam-width high-efficiency feed of low F/D parabolic reflectors.

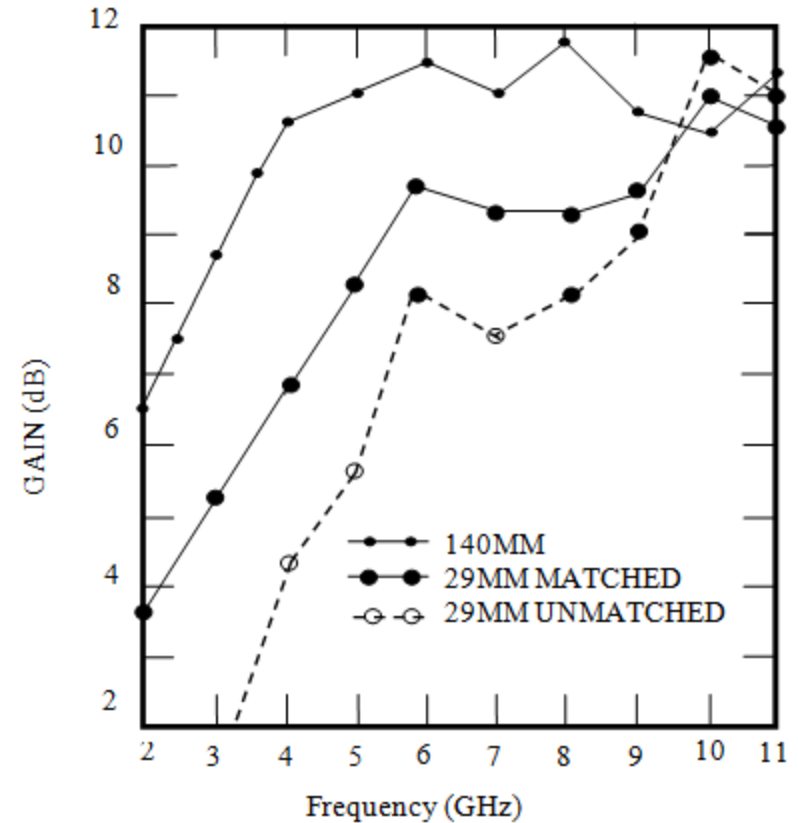
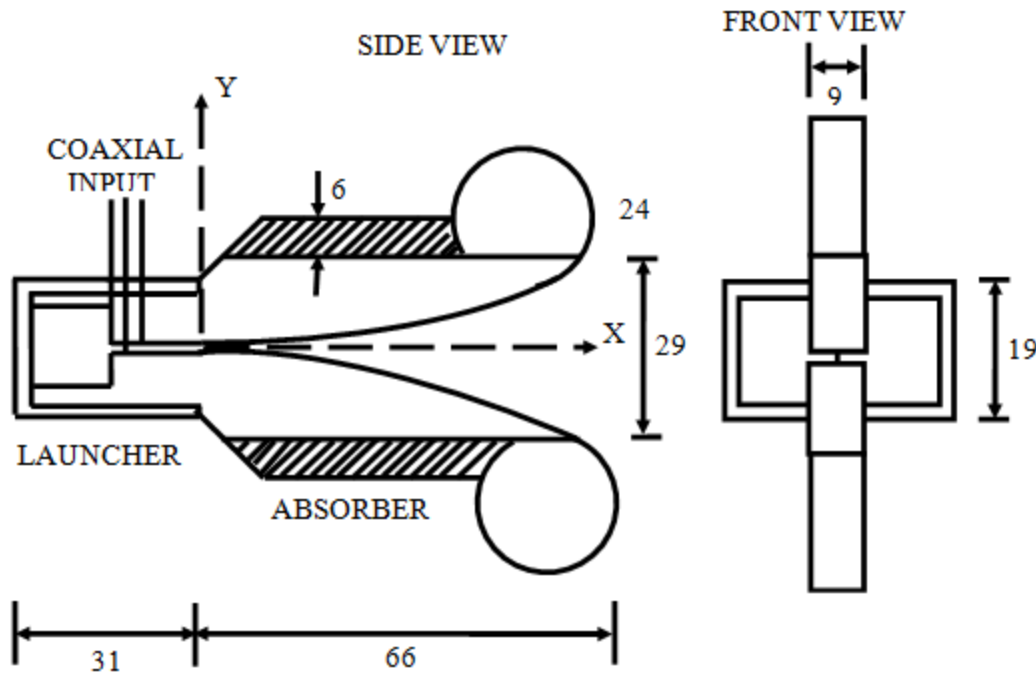
# Broadband Exponentially Tapered Horn



# Broadband Dual Ridged Horn



# Compact Aperture Matched Horn Antenna



**Exponential Ridges are used to increase bandwidth.**

**Aperture matching at the end is done to improve VSWR, reduce scattering and increase the gain.**