

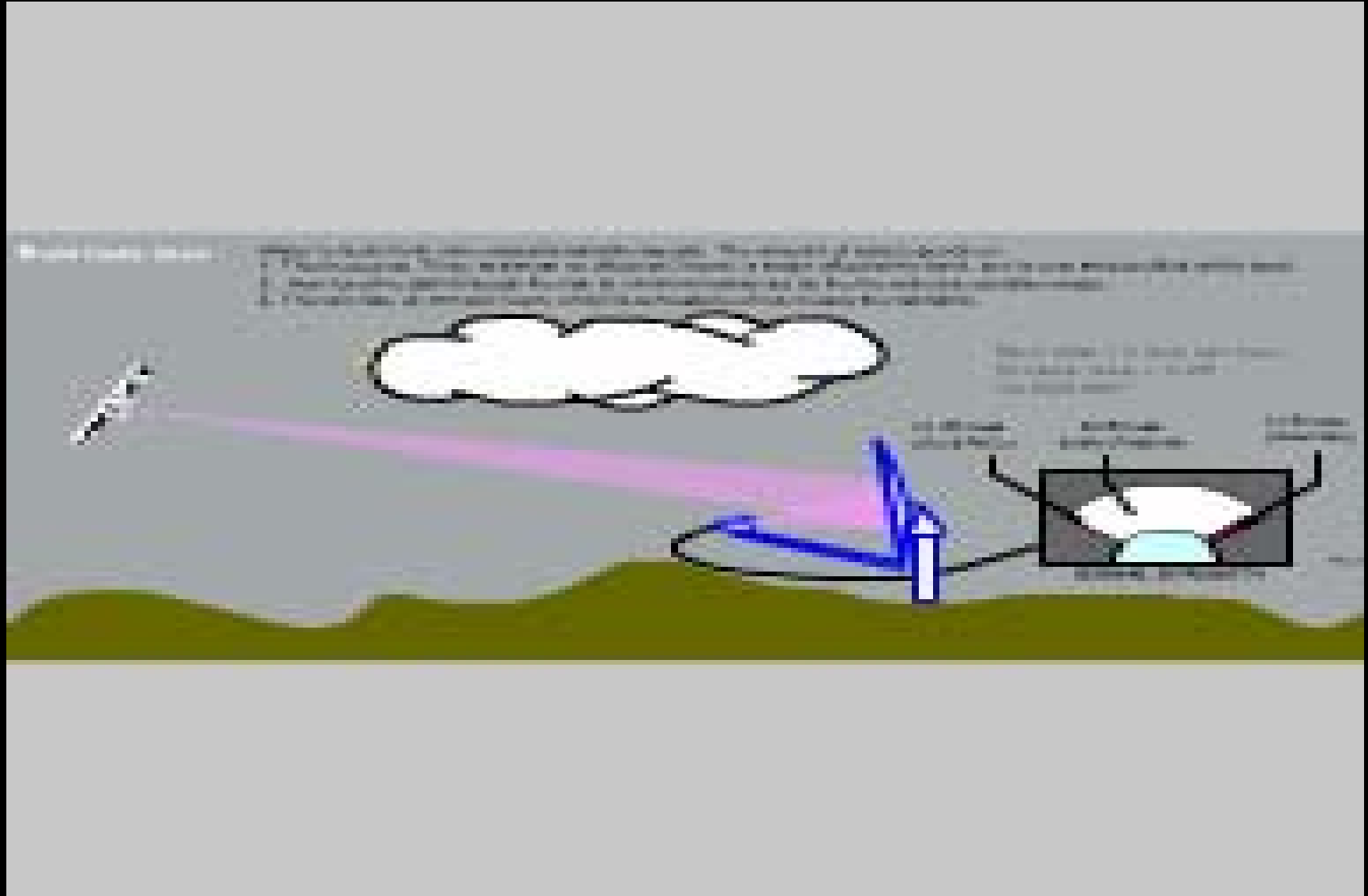
**The \$20 Billion Question:  
Can Satellite and Terrestrial Wireless  
Co-Exist in C-band?**

David Hartshorn  
Secretary General  
Global VSAT Forum

## About the Global VSAT Forum

- Non-Profit VSAT Industry Association
- 180+ Member Organizations in 80 Nations
- Advancing Satcom Interests Worldwide Thru:
  - Regulatory Reform & Market Access
  - Education & Training
  - Technical Support (e.g. Type Approvals, etc)
  - Industry Promotions (e. g. Events, Online, Publishing, etc)
  - Market Intelligence & Commercial Leads

# Why SatComs in C-band?



# Why C-band for satellites?

- **Spectrum:**
  - ITU table of allocations allows FSS only in selected bands
  - Bandwidth requirements for traditional FSS applications needs to be met in the selected band
- **Satellite Deployment:**
  - Many satellites available
  - Well established, inexpensive technology
  - Currently widely used for a multitude of satellite services like:
    - TV broadcast to cable networks and individual receivers
    - VSAT networks for public and private sector applications
      - Internet providers
      - E-Government, Digital Inclusion
      - Point-to-multipoint links
      - Satellite News Gathering

## New Users in C-band downlinks

**Is currently being introduced  
country by country worldwide**

**Is being considered by ITU**

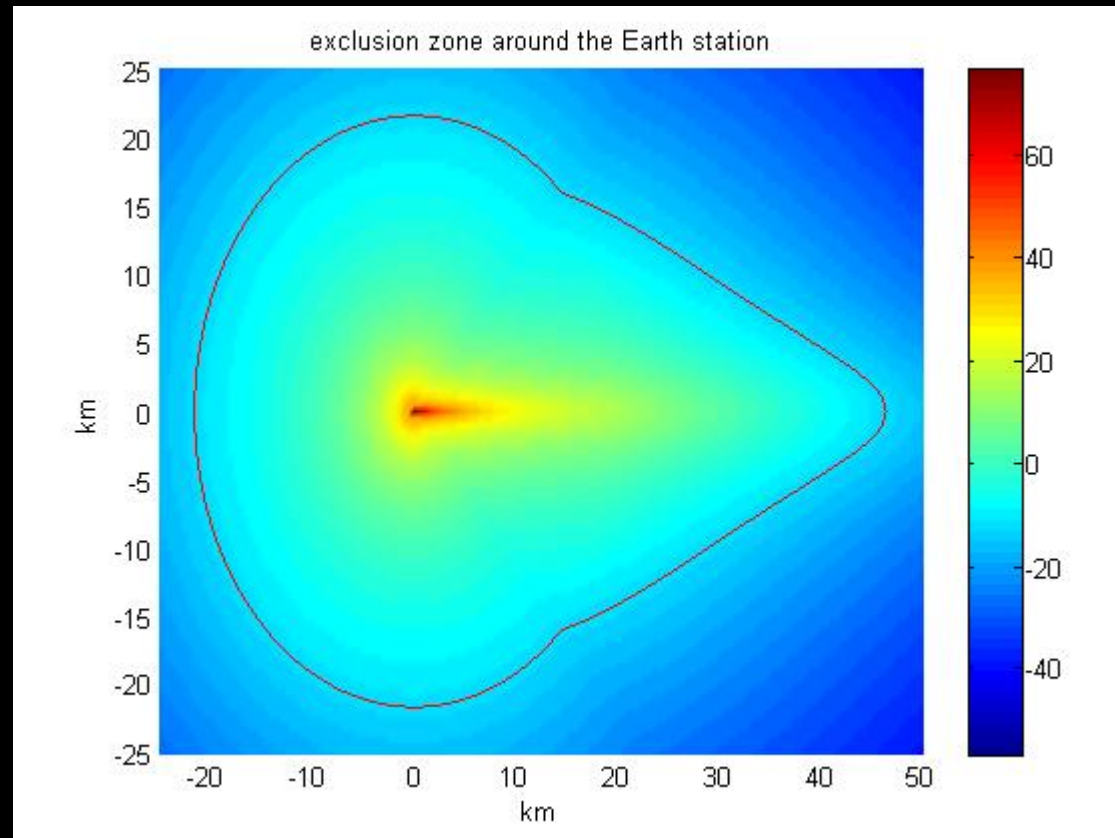


**BWA or IMT in ANY part of C-band downlink will have an impact on FSS reception in ALL of the band**

## Impact on FSS Reception

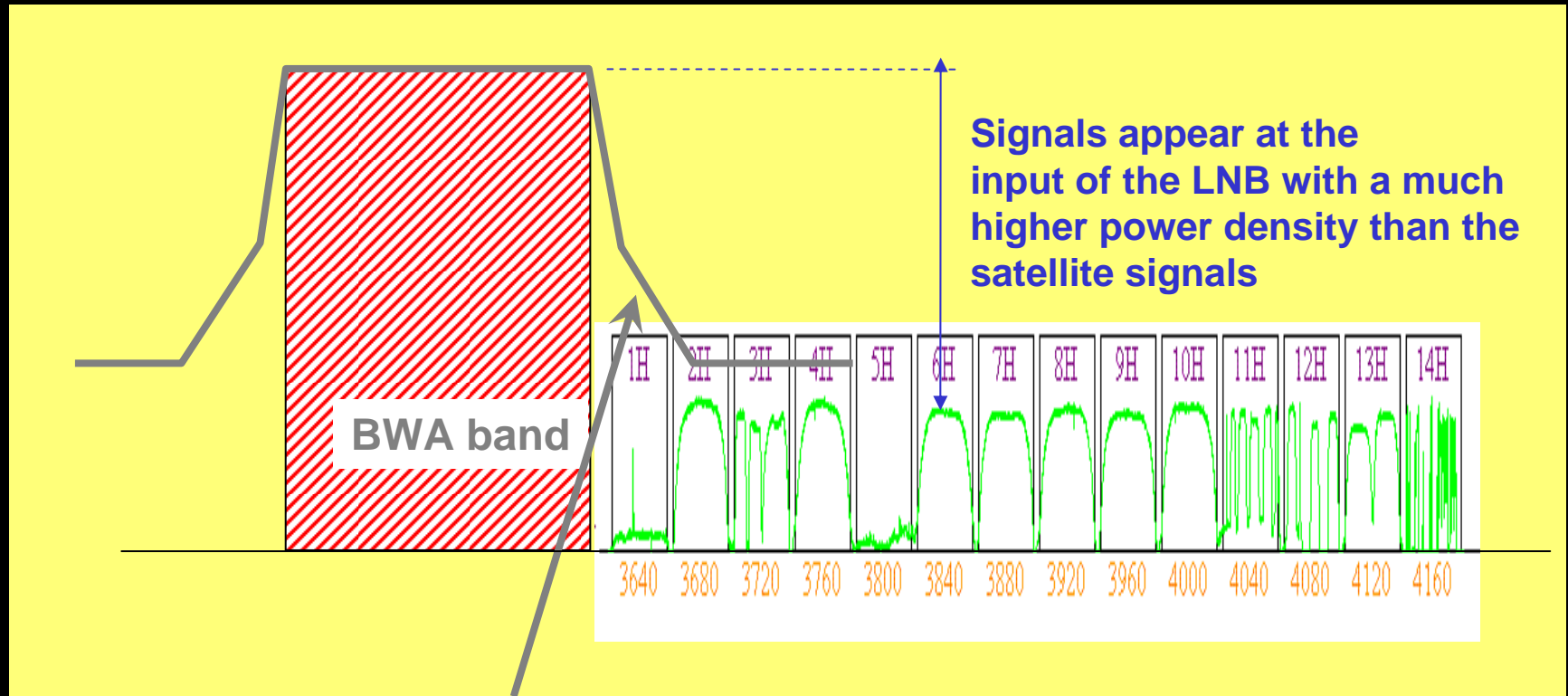
- In-band interference
  - Interference from unwanted emissions (outside the signal bandwidth)
  - Overdrive of LNB's
- ⇒ Exclusion zones around earth stations are required

# In-band Interference



Example of calculated exclusion zone around an earth station to counter interference from a single IMT base station in each cell (From French study to ITU Working Party 8F (Doc WP 8F/868))

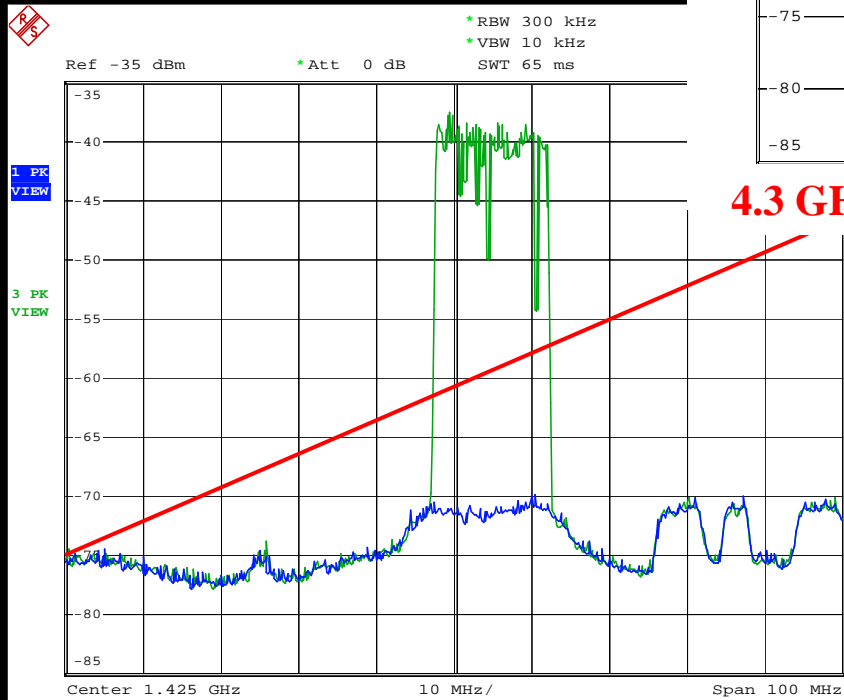
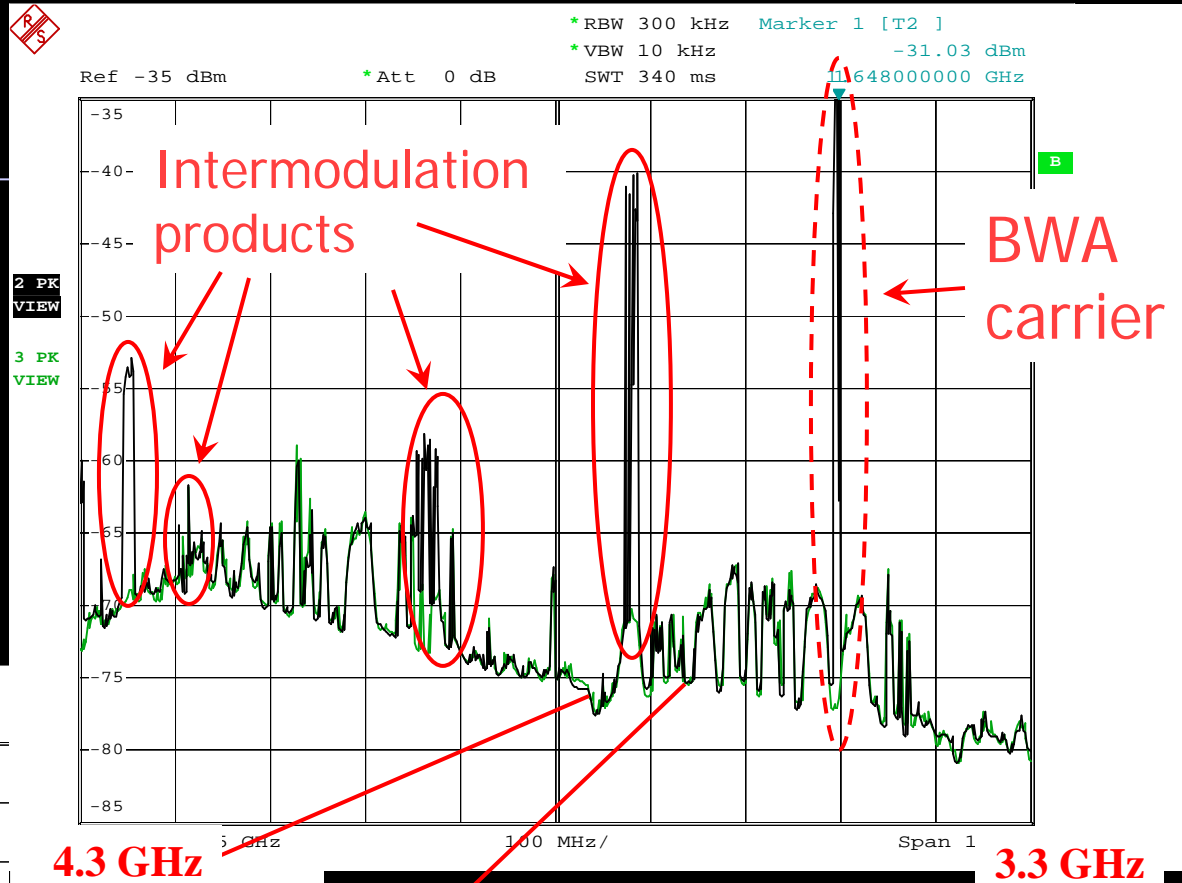
## Unwanted emissions



**How much suppression of out-of-band components can one realistically expect from BWA or IMT equipment?**

**Appendix 3 of the Radio Regulations provide limits for spurious emissions**

# Overdrive of LNB



**Distortion of  
received FSS spectre  
by BWA signal**

Source: Asiasat

# Exclusion Zone



Example of exclusion zone with a radius of 20 km around an earth station in Singapore

## Exclusion zones

- May be enforced for base stations with respect to specific earth stations
- Cannot be applied with respect to user terminals
- Will require user terminals which do not emit any signals when they are not in contact with a base station
- Cannot be applied with respect to unlicensed earth stations or earth stations at unknown locations
- Exclusion zones around earth stations may block large areas for BWA or IMT and prohibit effective and economically viable operation

## Conclusions

- BWA or IMT in a part or all of the FSS C-band downlink will be incompatible with general FSS reception in any part of C-band in the same geographical area
- BWA or IMT in a part of C-band may be compatible with FSS reception by a small number of earth stations if:
  - Appropriate exclusion zones around each of the earth stations are established
  - User terminals are designed not to emit any signals when not in contact with a base station
- Introduction of BWA or IMT by one country can block FSS reception in another country

## A Few Questions...

- What Has Been Your Experience?
- Is Spectrum Sharing Workable?
- If So, How Can the Process Be Made to Work?
- Are There Alternate Bands?