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## DVB-S2 Introduction

- SE II Outbound channel is based on DVB-S2 (EN302 307)
- The DVB-S2 system has been designed for several satellite broadband applications
- DVB-S2 offers better Spectral efficiency compared with DVB-S
  - Advance modulation schemes
  - Stronger FECs
  - Roll off factor of 0.2
  - The use of ACM

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## DVB-S2 Introduction

DVB-S2 Transport Stream

- The DVB-S2 standard allows the use of two frame sizes (for the BaseBand frames)
  - **Short Frames - 16200 bits (2KB)**
    - Reduces latency and jitter
    - Used for small networks or VoIP
  - **Normal Frames - 64800 bits (8KB)**
    - Increase throughput
    - Less over head related to the data transmitted

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To achieve a more efficient packing of the MPEG frames. SEII allows concatenation. A packet is split across two adjacent BB frames even if the next frame uses a more robust MODCOD.

The frame size is decided in the sizing process of the network, and does not change.

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# DVB-S2 Introduction

MODCOD list and Characteristics - Normal

MODCOD	Data Bits per Symbol	Minimum Es/N0 (dB)	MODCOD	Data Bits per Symbol	Minimum Es/N0 (dB)
QPSK 1/4	0.478577	-1.4	8PSK 5/6	2.422276	10.3
QPSK 1/3	0.640827	-0.54	8PSK 8/9	2.585924	11.5
QPSK 2/5	0.770627	0.1	8PSK 9/10	2.618365	11.8
QPSK 1/2	0.965327	1.5	16APSK 2/3	2.574613	10.2
QPSK 3/5	1.160026	2.7	16APSK 3/4	2.896932	11.4
QPSK 2/3	1.290788	3.6	16APSK 4/5	3.090495	12.2
QPSK 3/4	1.452076	4.5	16APSK 5/6	3.221863	12.8
QPSK 4/5	1.549426	5.2	16APSK 8/9	3.43953	14.1
QPSK 5/6	1.615288	5.7	16APSK 9/10	3.48268	14.4
QPSK 8/9	1.724416	6.8	32APSK 3/4	3.623332	14.3
QPSK 9/10	1.746049	7.0	32APSK 4/5	3.866247	15.5
8PSK 3/5	1.739569	6	32APSK 5/6	4.030589	16.5
8PSK 2/3	1.935658	7	32APSK 8/9	4.302894	18.5
8PSK 3/4	2.177525	8.3	32APSK 9/10	4.356875	18.9

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The above table refers to **normal** frame length

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# DVB-S2 Introduction

MODCOD list and Characteristics - Short

MODCOD	Data Bits per Symbol	Minimum Es/N0 (dB)	MODCOD	Data Bits per Symbol	Minimum Es/N0 (dB)
QPSK 1/4	0.357467	-0.4	8PSK 5/6	2.33512	10.8
QPSK 1/3	0.615532	0.0	8PSK 8/9	2.528046	12.0
QPSK 2/5	0.744564	0.1	16APSK 2/3	2.505223	10.5
QPSK 1/2	0.830585	1.5	16APSK 3/4	2.761633	11.7
QPSK 3/5	1.131661	2.9	16APSK 4/5	2.932574	12.5
QPSK 2/3	1.260694	3.8	16APSK 5/6	3.103514	13.1
QPSK 3/4	1.389725	4.7	16APSK 8/9	3.359924	14.4
QPSK 4/5	1.475747	5.4	32APSK 3/4	3.419165	14.7
QPSK 5/6	1.561768	5.9	32APSK 4/5	3.630805	15.2
QPSK 8/9	1.6908	7.3	32APSK 5/6	3.842446	16.7
8PSK 3/5	1.692033	7	32APSK 8/9	4.159906	17.7
8PSK 2/3	1.884959	7.5			
8PSK 3/4	2.077885	8.8			

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The above table refers to **short** frame length

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## System Architecture

MODCOD Control – Flow description

- Each VSAT reports its measured OB Es/N0 level once per second
- According to the Es/N0, the HSP assigns a MODCOD to each VSAT based on the MODCOD thresholds
- If a change of MODCOD occurs, the HSP advertises the new MODCOD to the DPS
- The DPS marks each packet according to the currently selected MODCOD
  
- There is a safety margin (typically 1.65dB) above the thresholds in the previous tables

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The HSP advertises MODCOD changes as a multicast message to the DPS and NMS via 224.0.1.20 on UDP port 5418.

The MODCOD change can be to a more efficient one if the Es/N0 level rises above a threshold, or to a more robust MODCOD if the Es/N0 falls.

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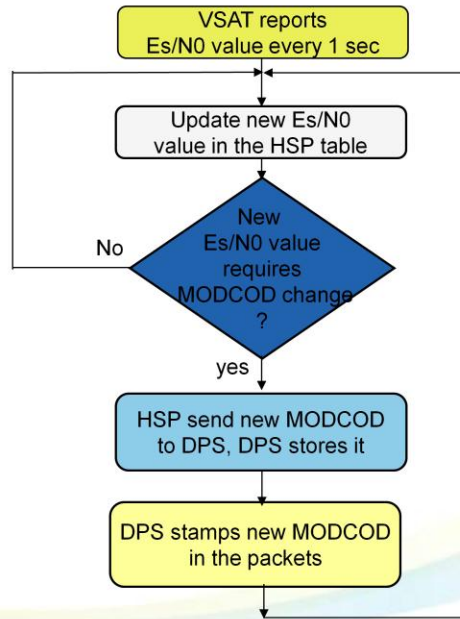
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# MODCOD Algorithm

Flow Diagram



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**Thank You**

*Boundless Communications*