



Motion vectors based adaptation of leak factor for AR-FGS

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Adaptive-reference FGS with local adaptation

- Leaky prediction scheme for FGS has been adopted to improve the coding performance in low delay configuration
- Local adaptation of the leak factor for adaptive-reference FGS was proposed in JVT-S092
- Adaptation based on MB type
- For the case of all-zero coefficients in the base layer, the α leak factor is adapted as follows

mb_type	adjustment
P_Skip	+2/32
P_L0_16x16	0
P_L0_L0_16x8_8x16, P_L0_L0_16x8_8x16	2/32
P_8x8, P_8x8ref0	4/32

- Improvement of up to 0.15dB reported in JVT-S092
- AHG established to study further improvements

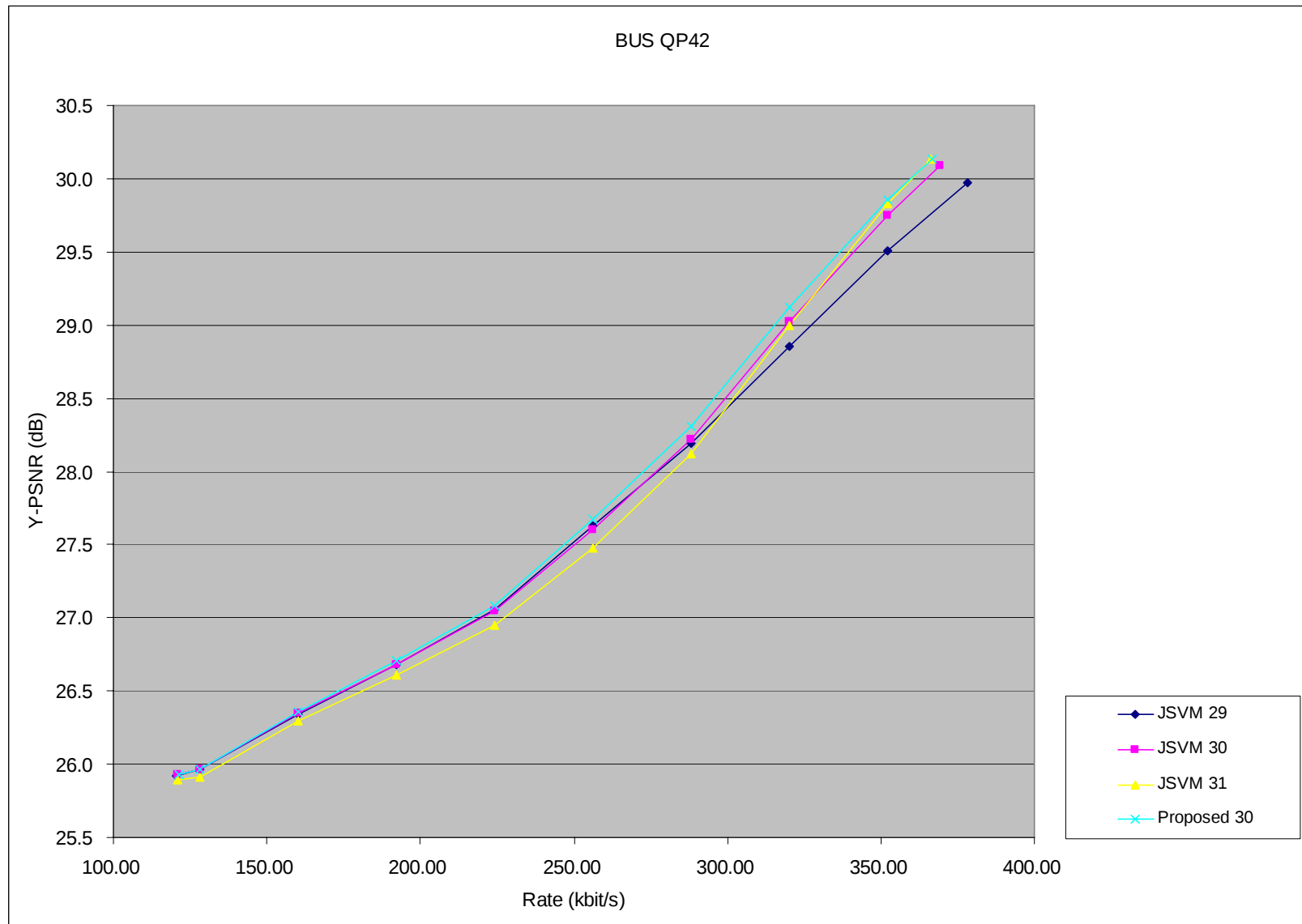
Proposed modification

- We investigate adaptation based on the properties of the motion vectors around the current block
- The variance of the motion vector values in the macroblock used as a measure of influence
- Computation performed once per macroblock
- The α leak factor is adjusted as follows

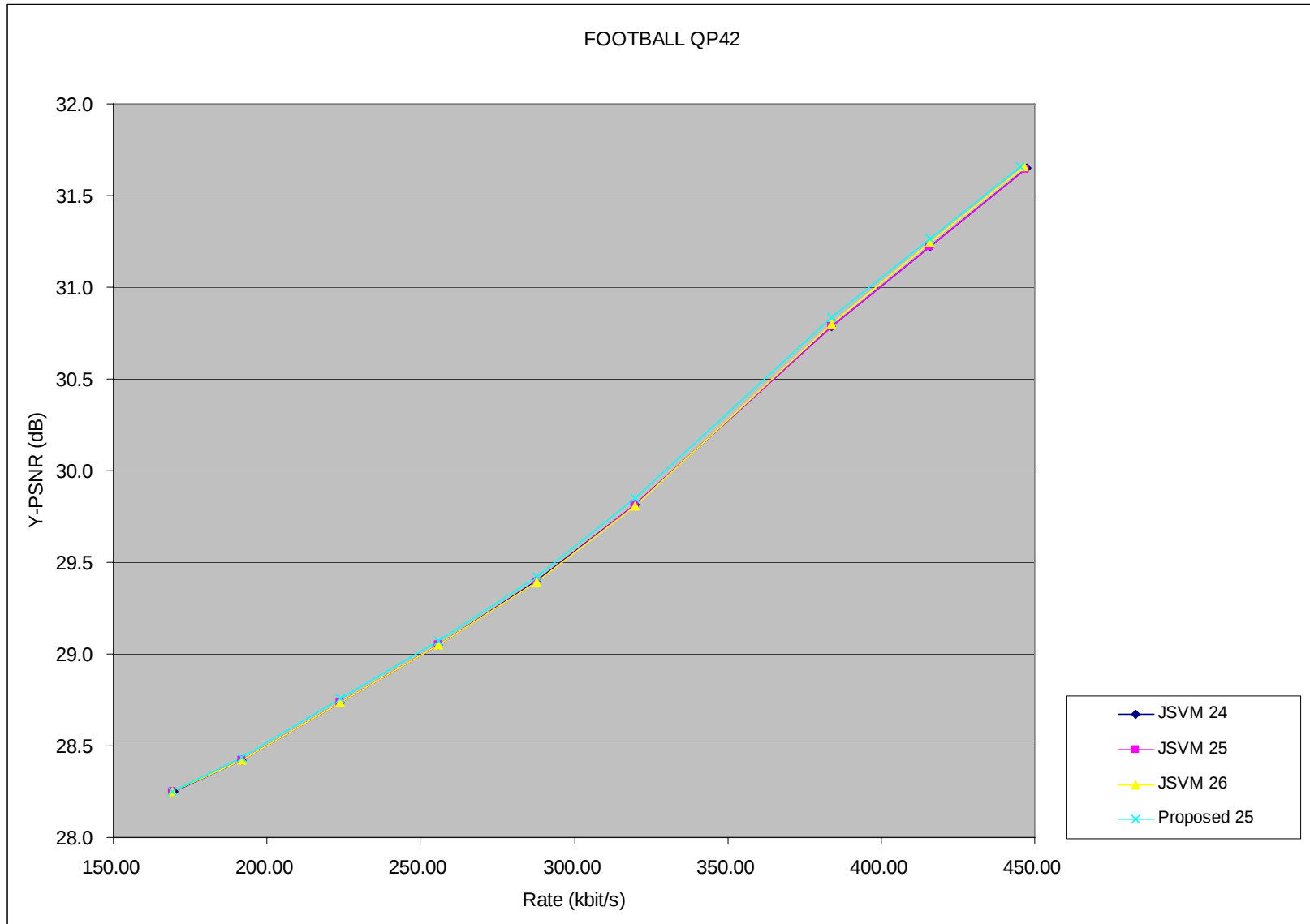
mb_type	MV variance	adjustment
P_Skip	n/a	+2/32
Other	> 3600	-8/32
	> 1024	-6/32
	> 256	-4/32
	> 64	-3/32
	> 16	-2/32
	> 0	-1/32
	0	0

- Simulations performed using conditions defined in JVT-P307

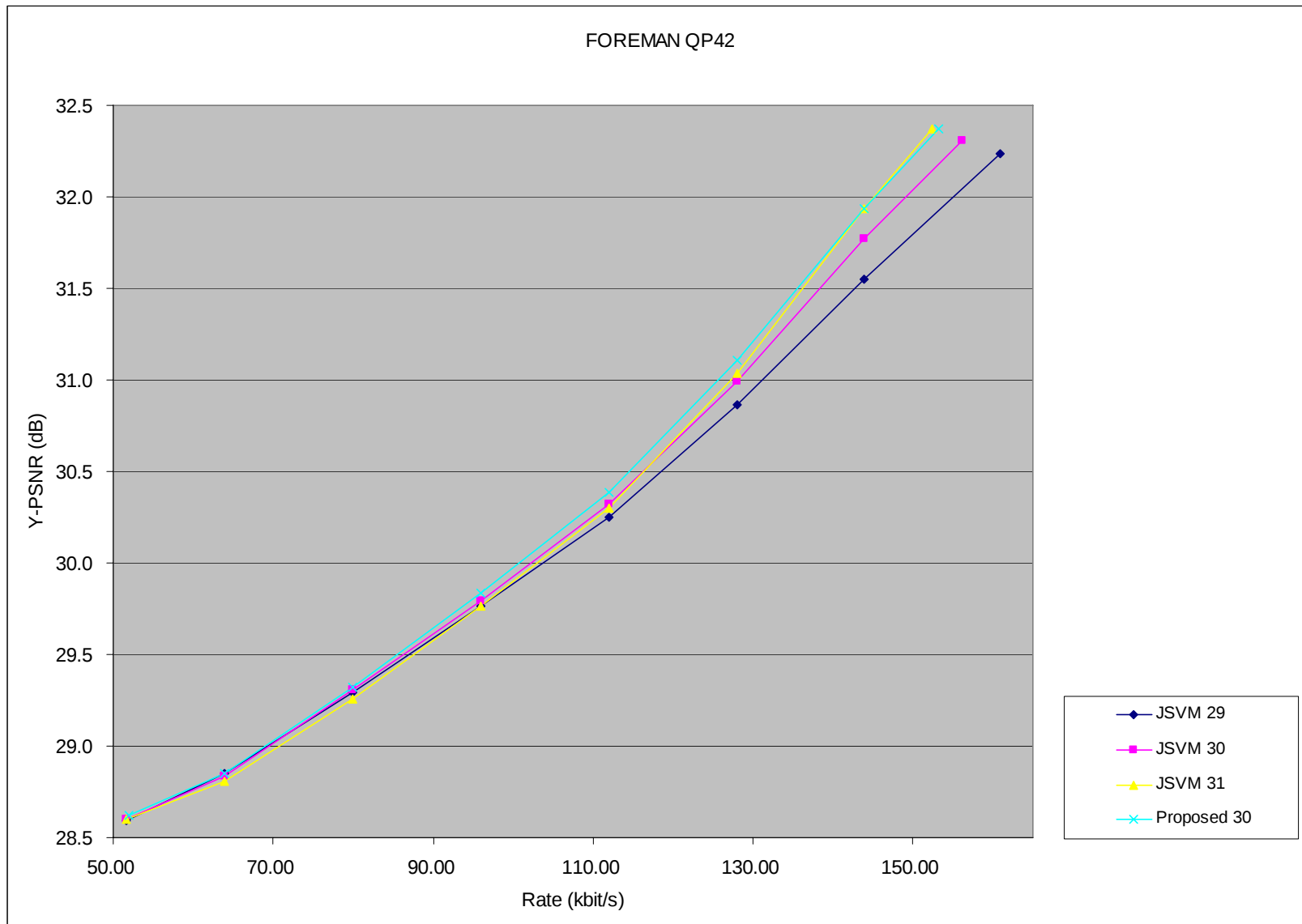
Results – bus CIF @ 15fps, QP42



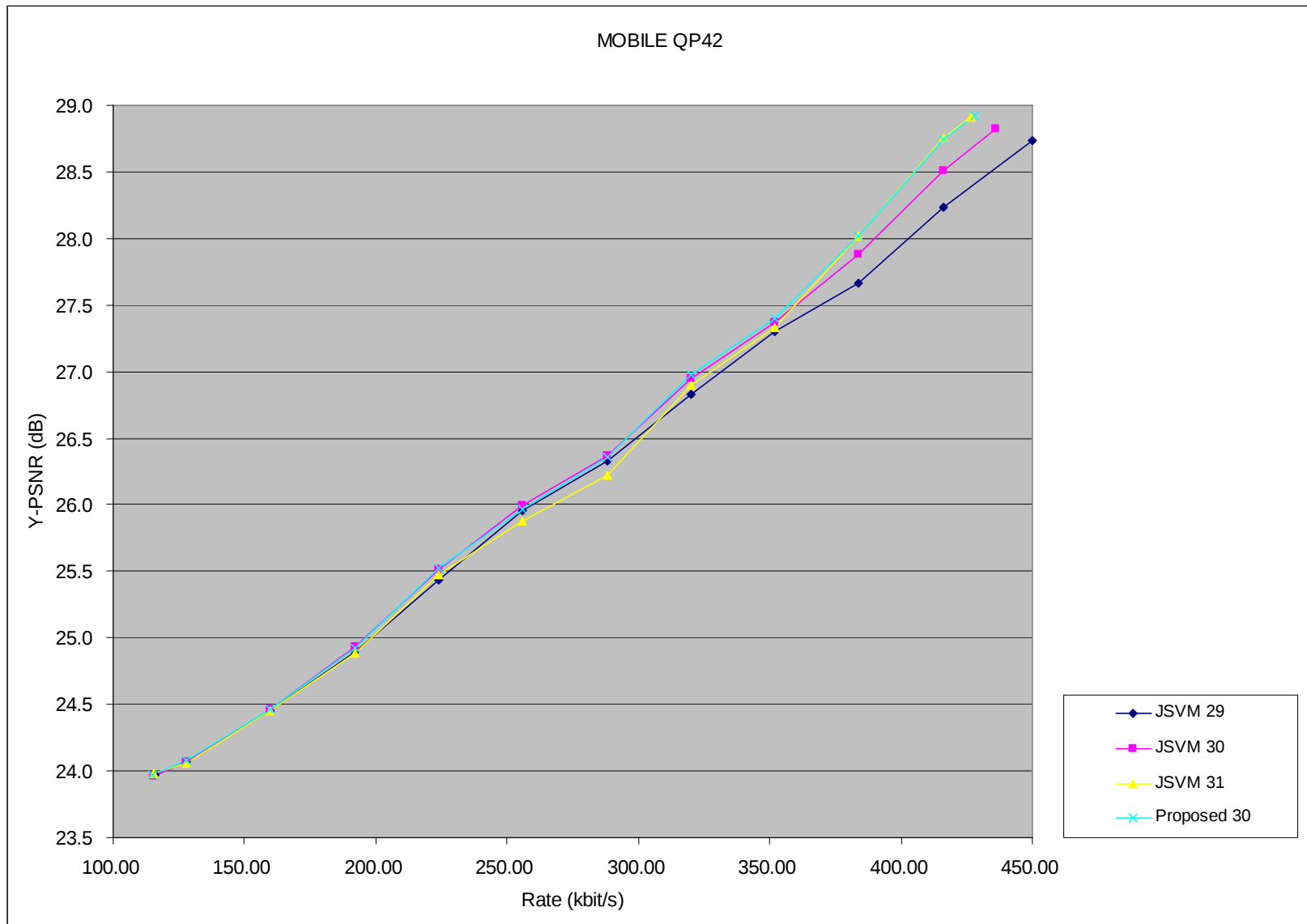
Results – football CIF @ 15fps, QP42



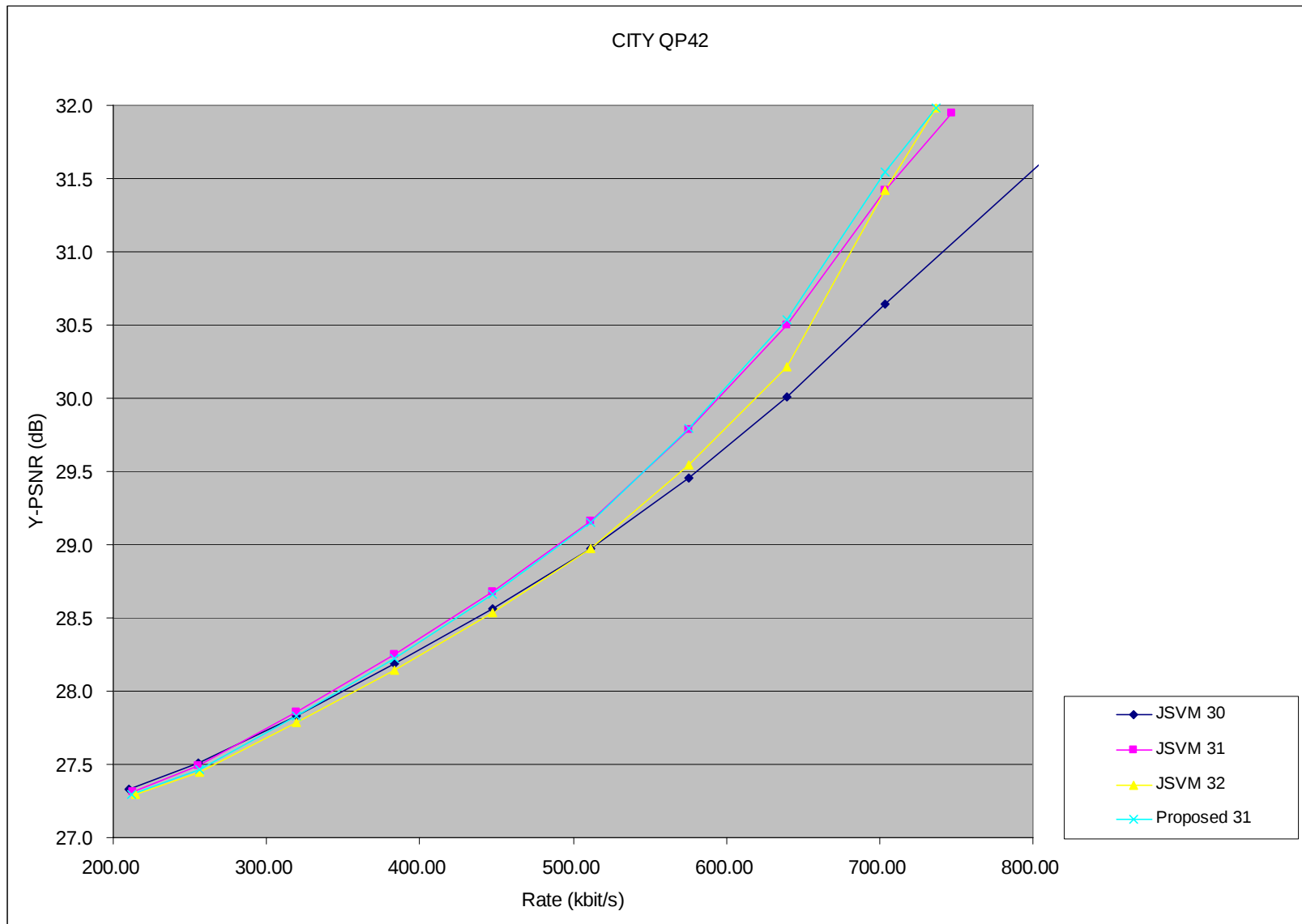
Results – foreman CIF @ 15fps, QP42



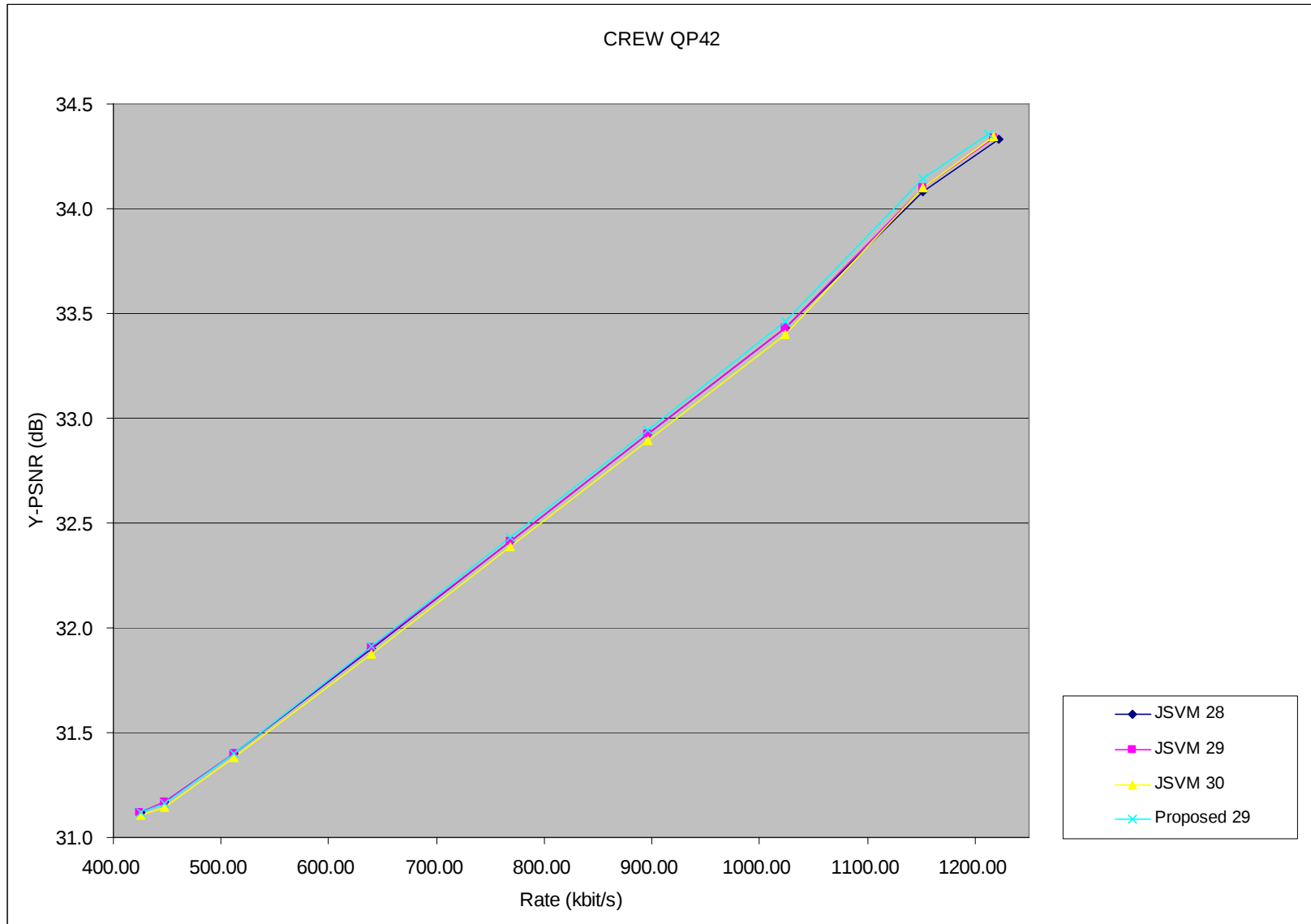
Results – mobile CIF @ 15fps, QP42



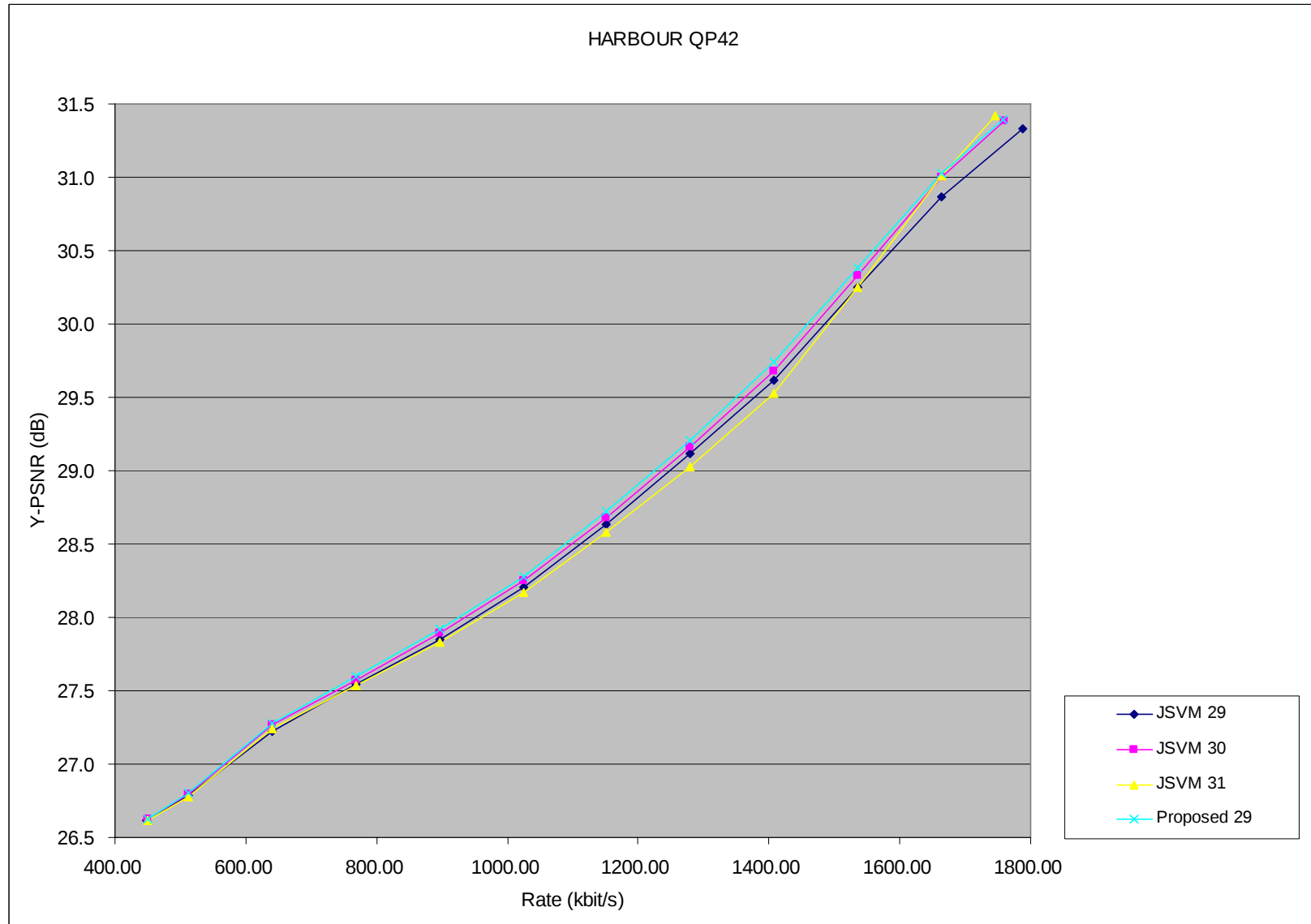
Results – city 4CIF @ 30fps, QP42



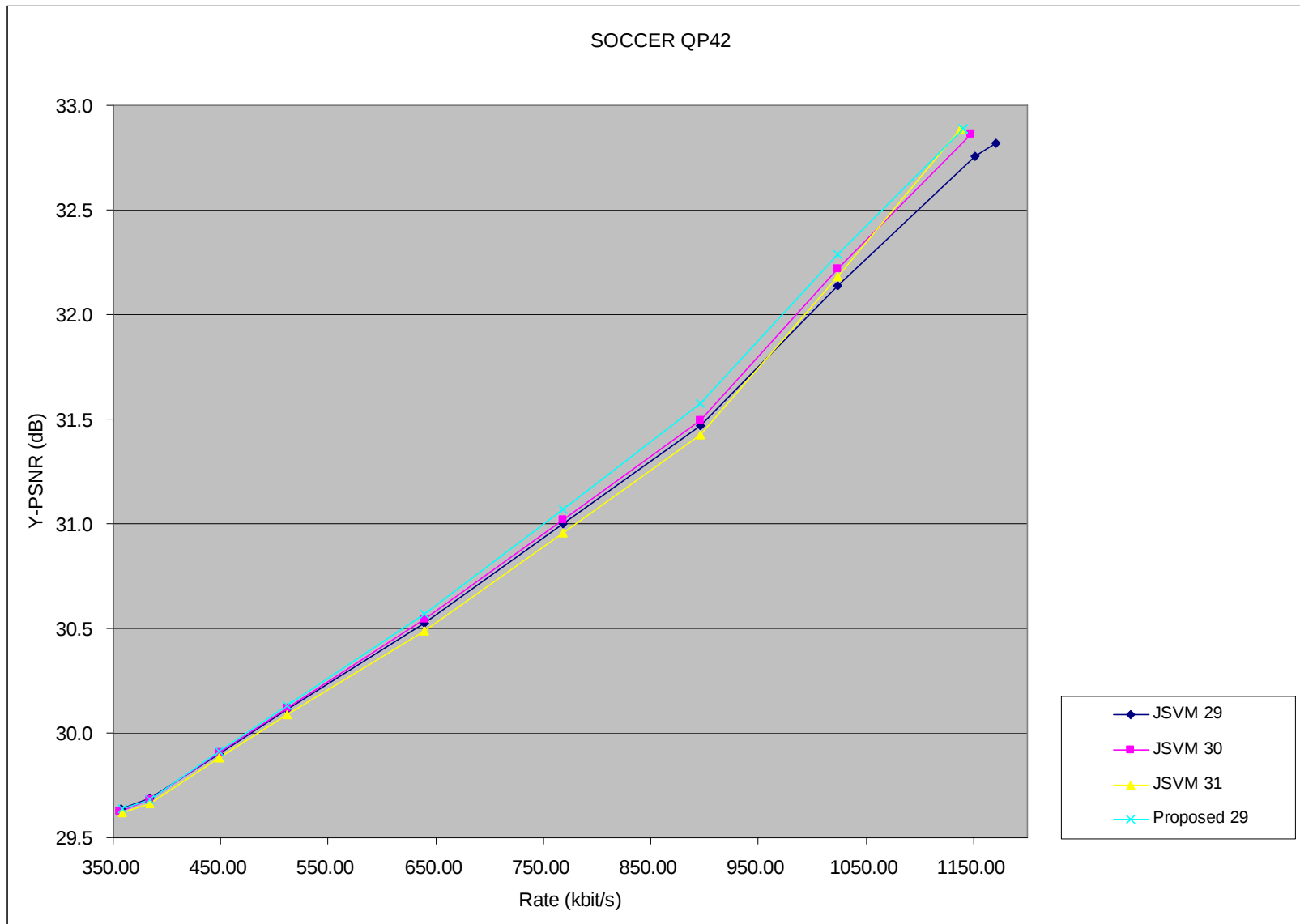
Results – crew 4CIF @ 30fps, QP42



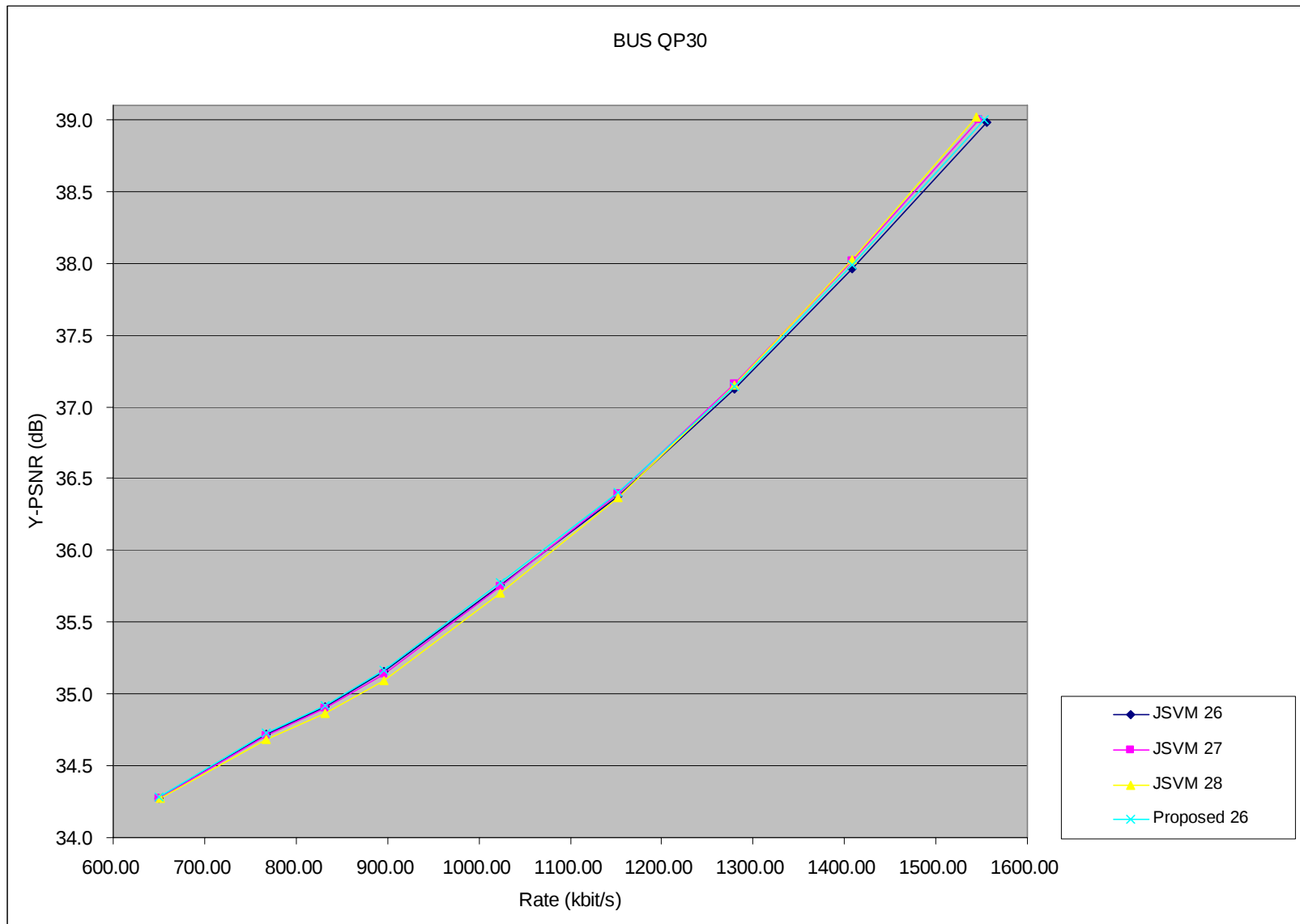
Results – harbour 4CIF @ 30fps, QP42



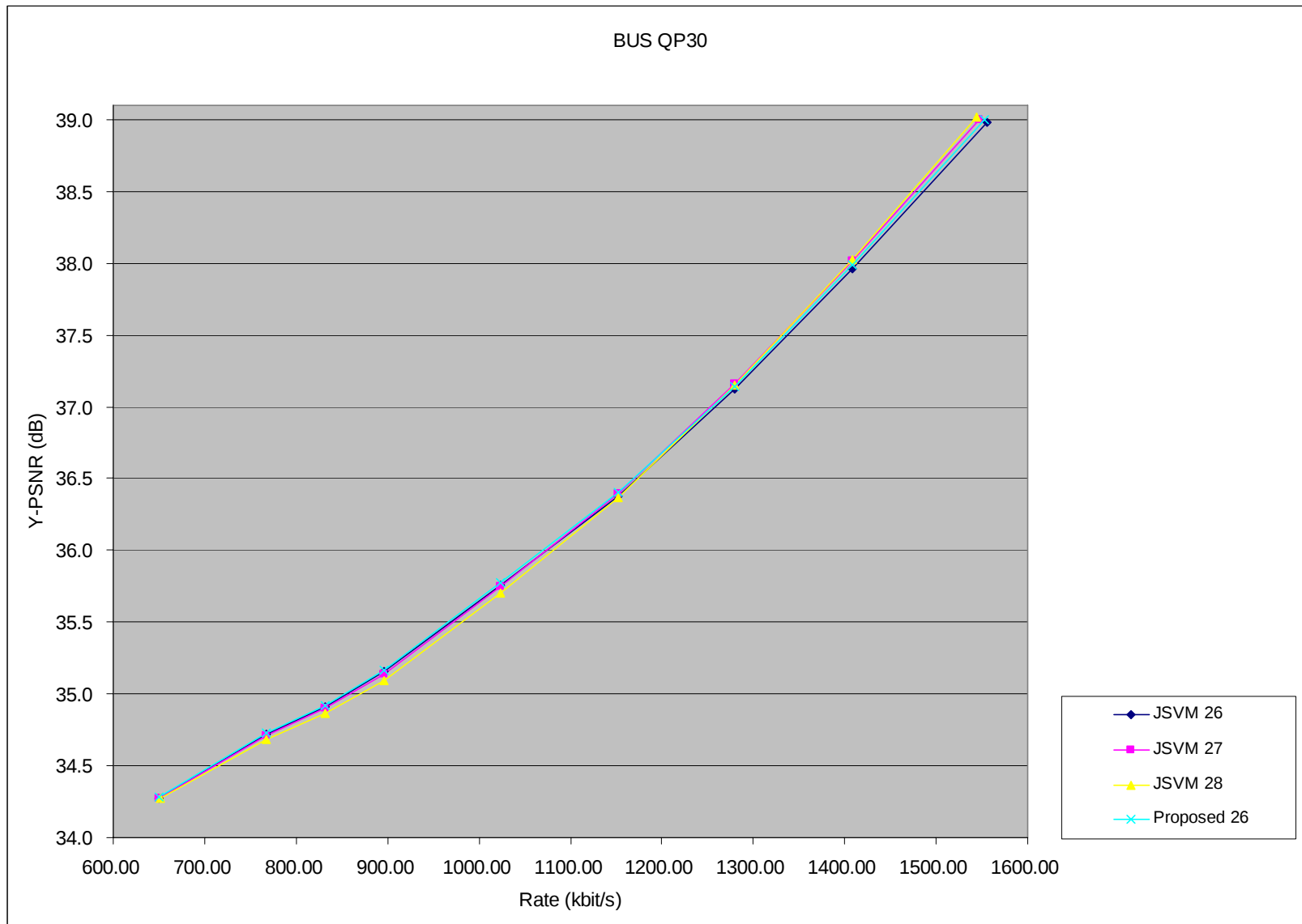
Results – soccer 4CIF @ 30fps, QP42



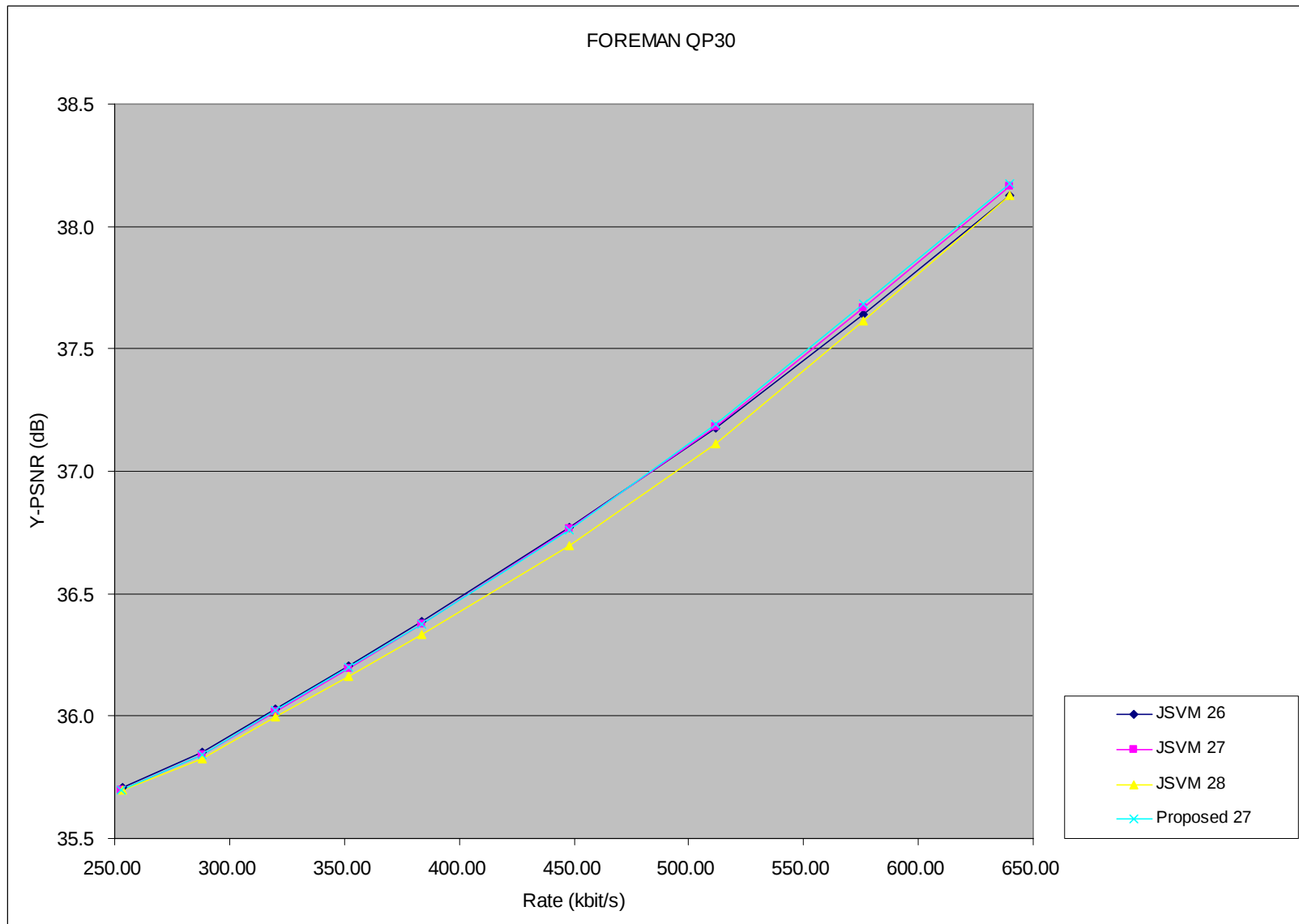
Results – bus CIF @ 15fps, QP30



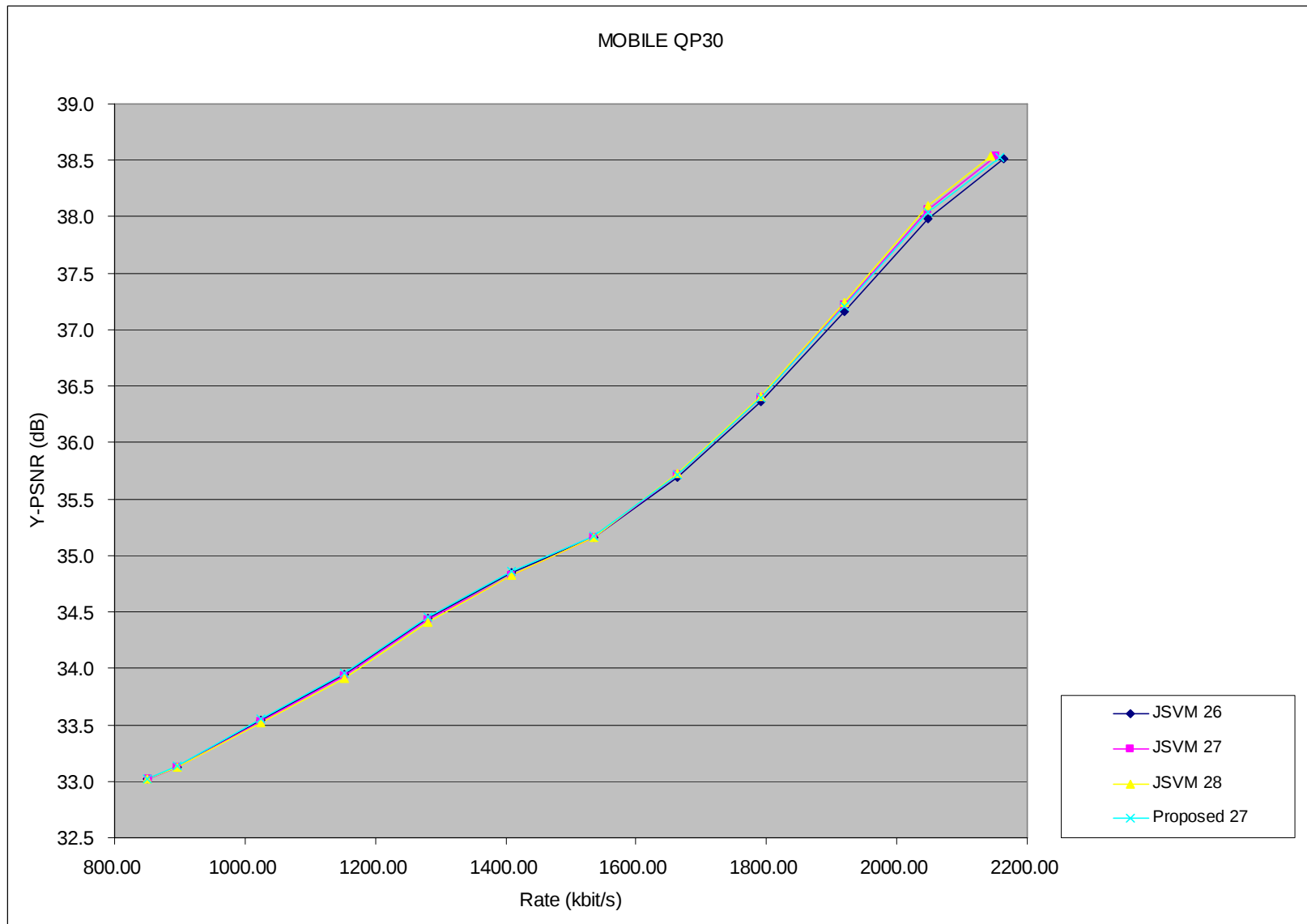
Results – football CIF @ 15fps, QP30



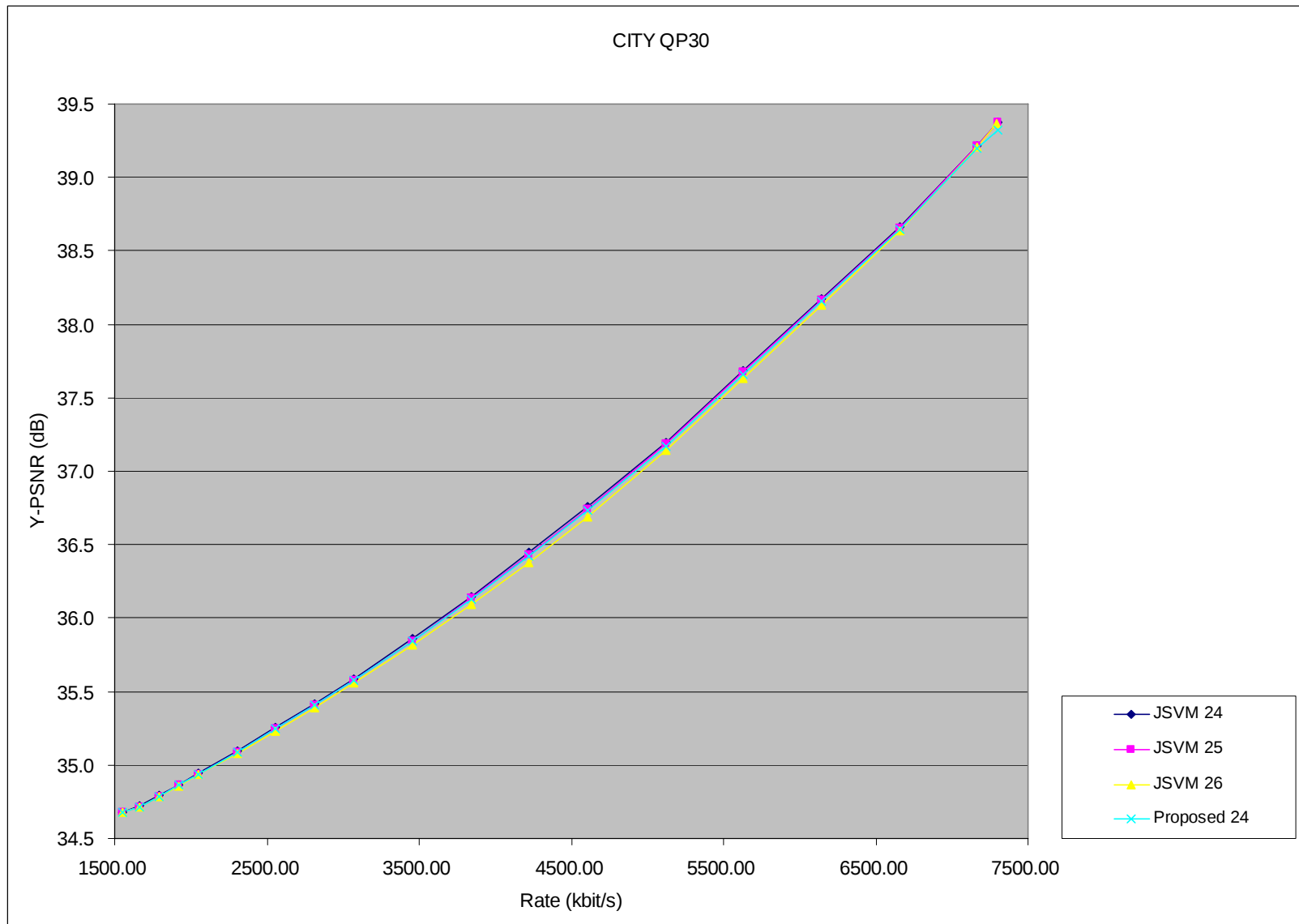
Results – foreman CIF @ 15fps, QP30



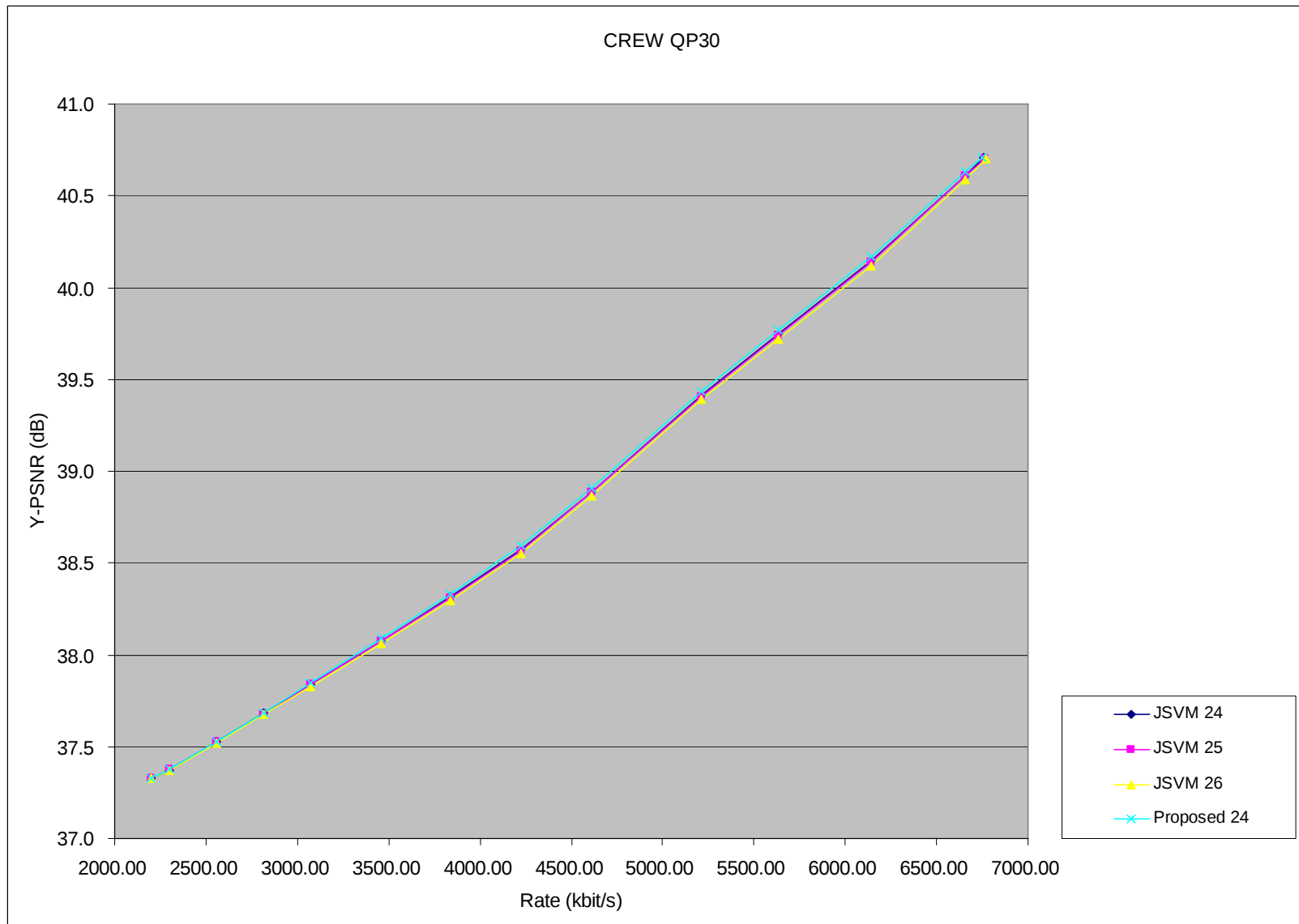
Results – mobile CIF @ 15fps, QP30



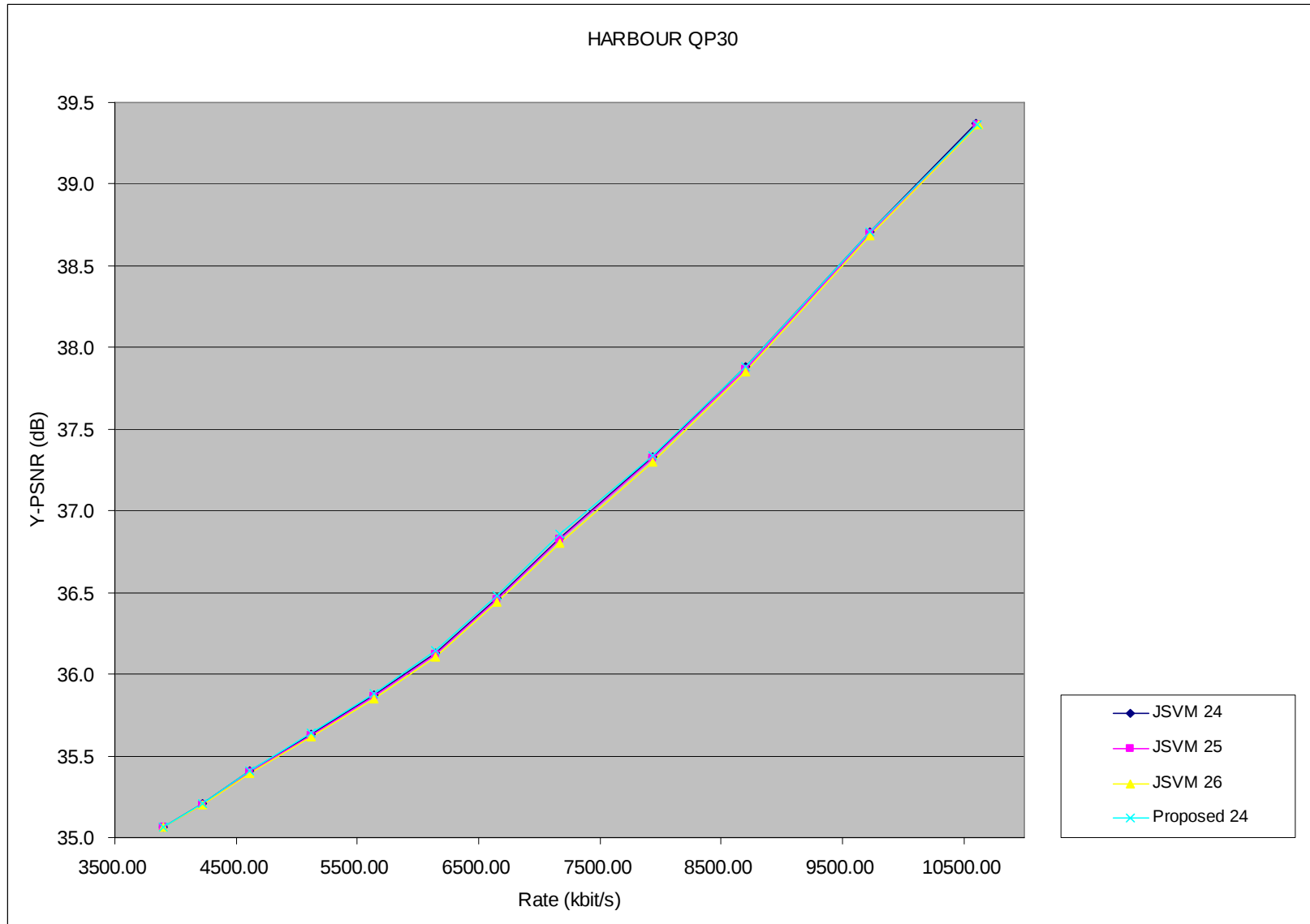
Results – city 4CIF @ 30fps, QP30



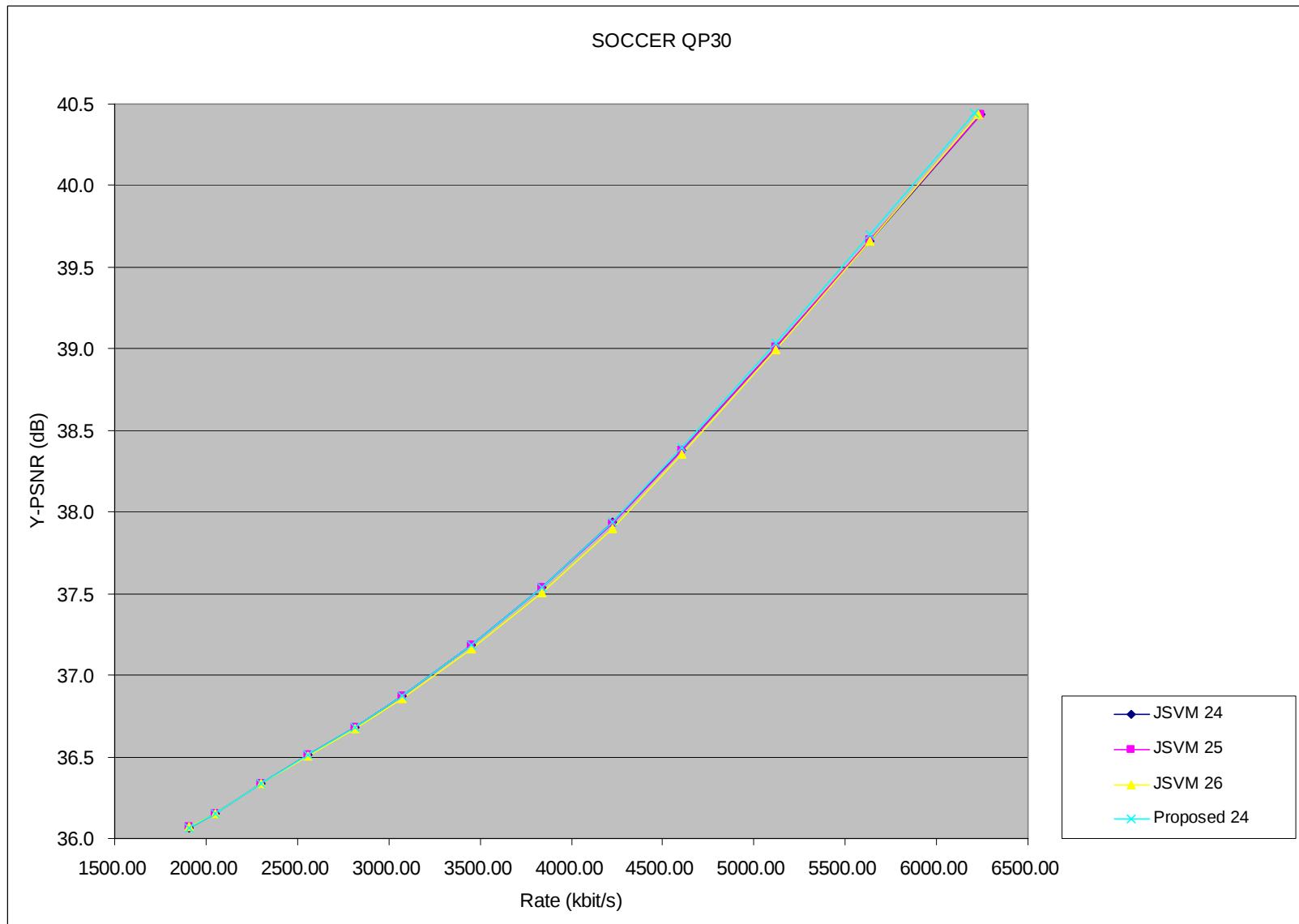
Results – crew 4CIF @ 30fps, QP30



Results – harbour 4CIF @ 30fps, QP30



Results – soccer 4CIF @ 30fps, QP30



- Results obtained so far
 - Up to 0.15dB improvement for CIF at QP42
 - Less improvement at higher resolutions and at QP30
- Further work
 - Improve performance by more local approach (per block estimation of MV differences)
 - Reduce computational complexity by motion field subsampling
- Consider combination with other proposals from the Ad-Hoc Group
 - Signalling of leak factor deltas in slice header