MPEG 3DTV FTV EE on the Lovebird1 Data Set

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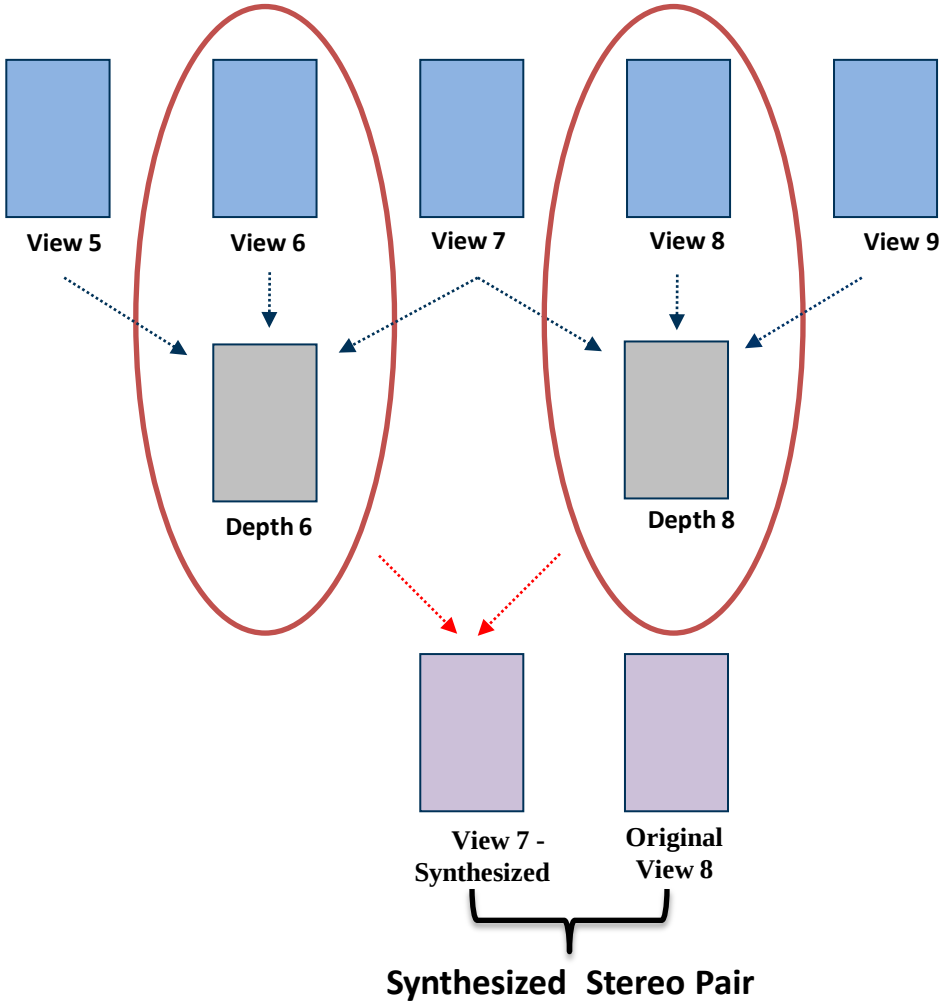
Outline

- FTV Exploration Experiments(EE)
- EE1: Depth Estimation
- EE4: Coding Experiment

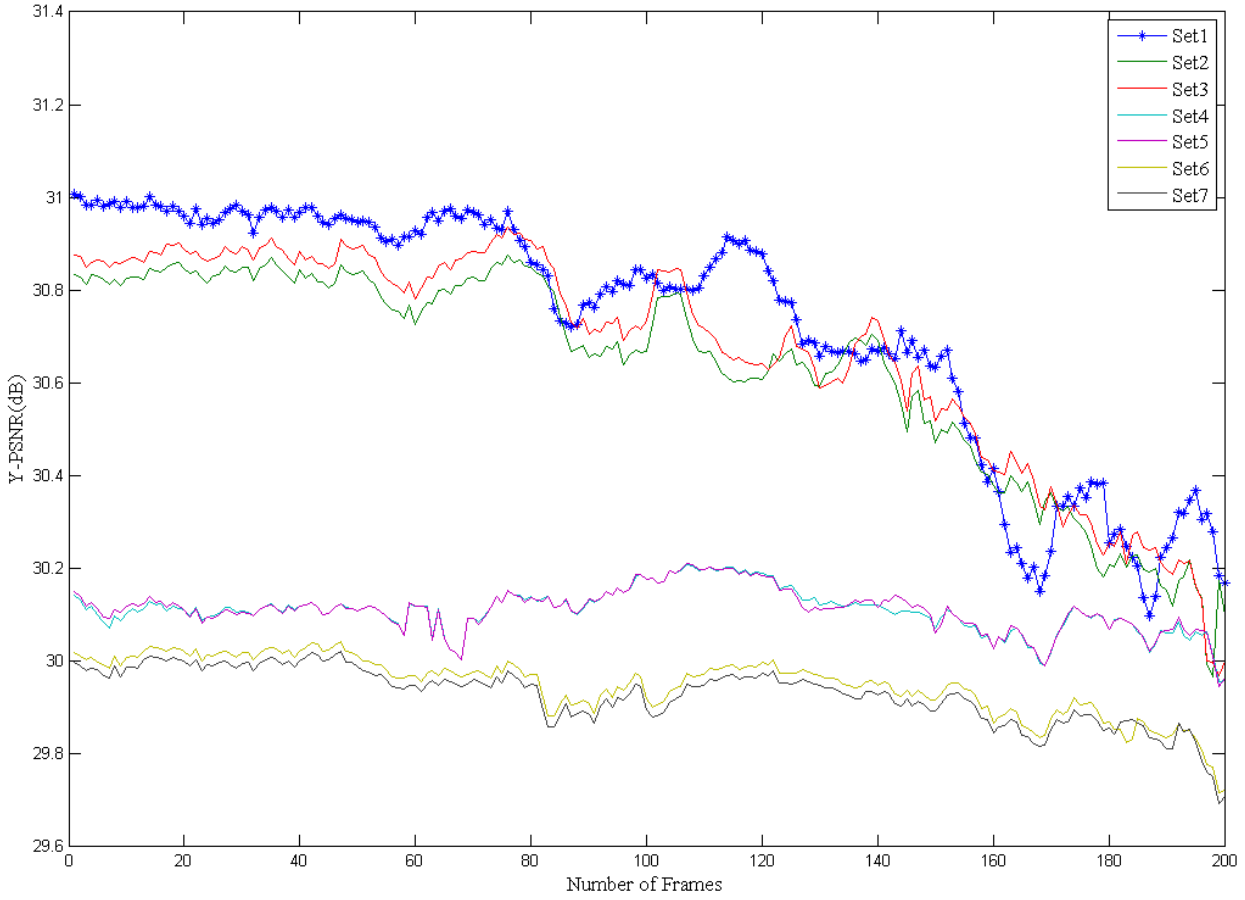
FTV Exploration Experiments

- EE1
  - Experiment for the depth map generation improvement with DERS 5.0 and the synthesized views quality improvement with VSRS 3.5.
- EE4
  - Coding experiments for the texture views and the depth map using the JMVC 5.0.5 reference software.
  - The goal of experiment is to get insights on how the depth maps coding affects the quality of synthesized views.

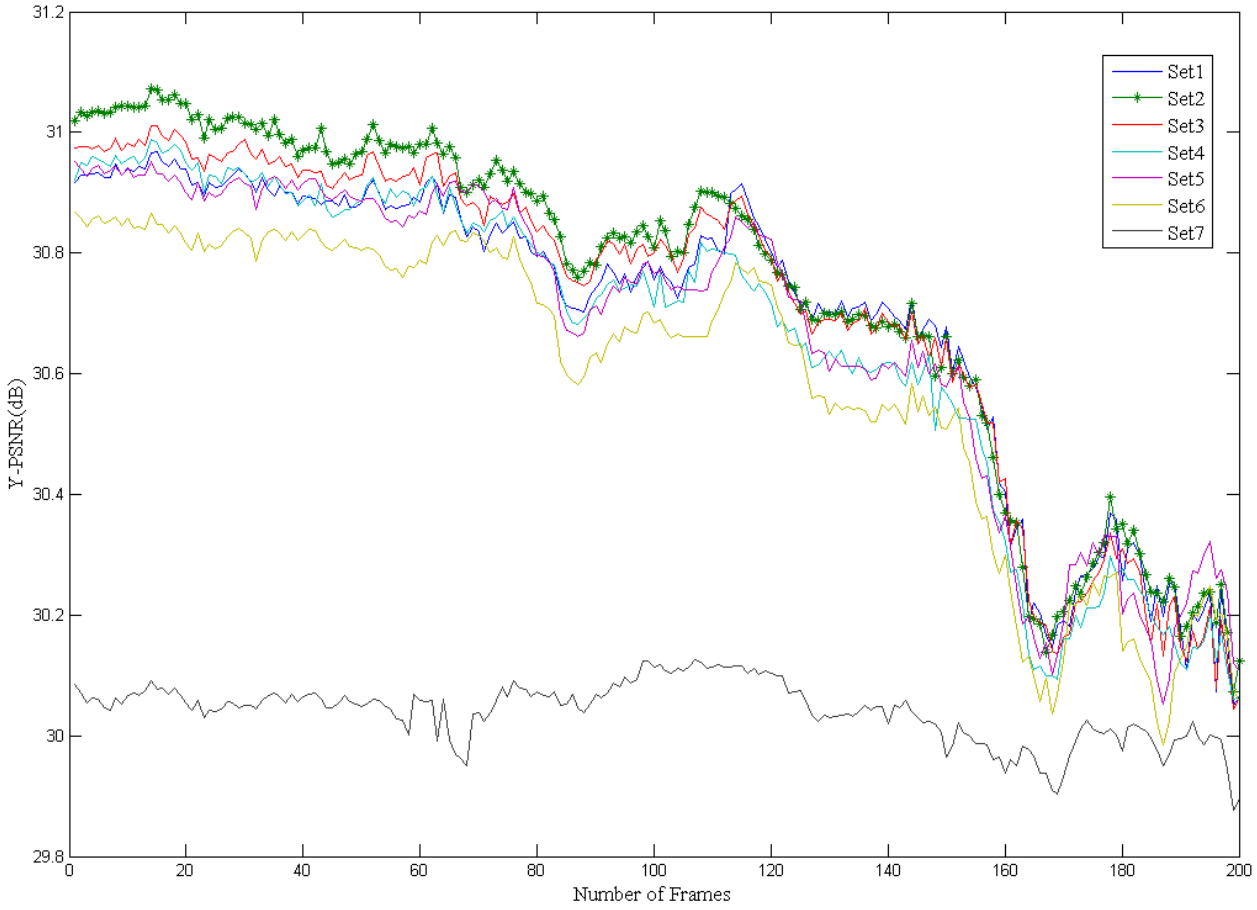
Exploration Experimental 1 Set Up



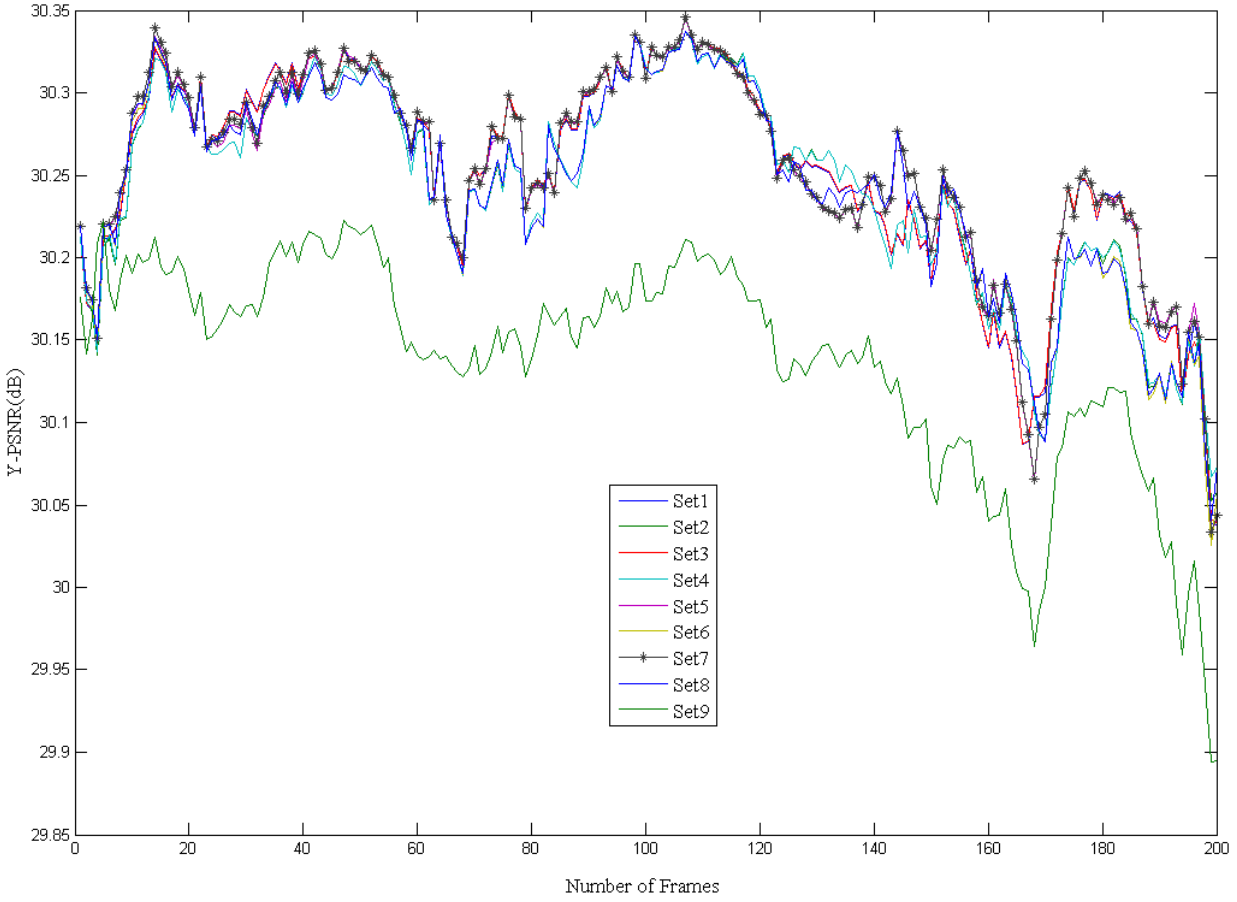
Automatic Depth Estimation Mode



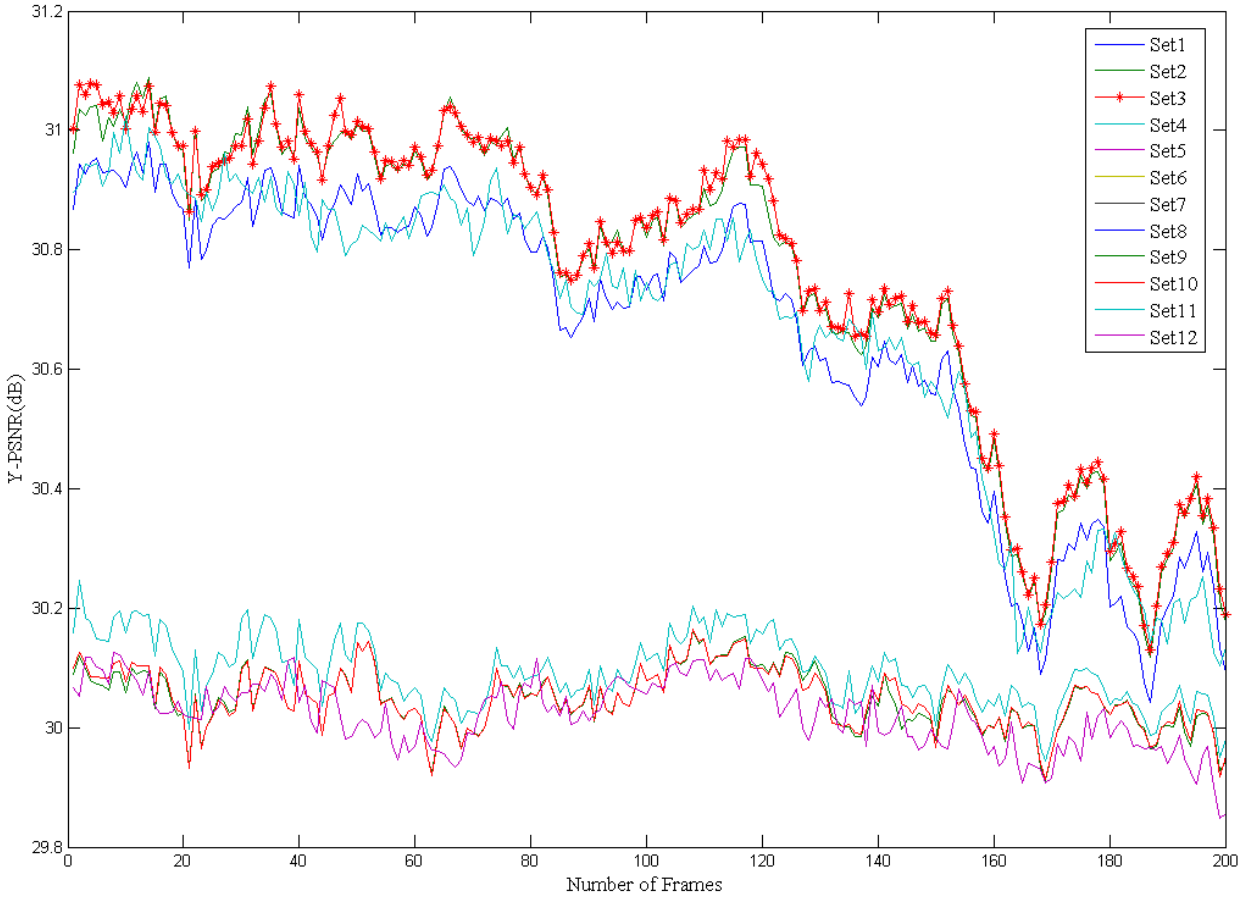
Semi-automatic Depth Estimation Mode 1



Semi-automatic Depth Estimation Mode 2



Reference Depth Estimation Mode



EE1 Summary

Depth Estimation Mode	Average Y-PSNR (dB)
Automatic Mode	30.73070
Semi-automatic Mode 1	30.74090
Semi-automatic Mode 2	30.25470
Reference Depth Mode	30.76841

Estimated Depth Maps

(Estimated depth maps obtained by DERS 5.0 using depth estimation mode “3”)

(a) Frame #01

(d)Frame #100

(C) Frame #150

(d)Frame #200

Synthesized Views

(Synthesized "lovebird1" view 7 using VSRS 3.5)

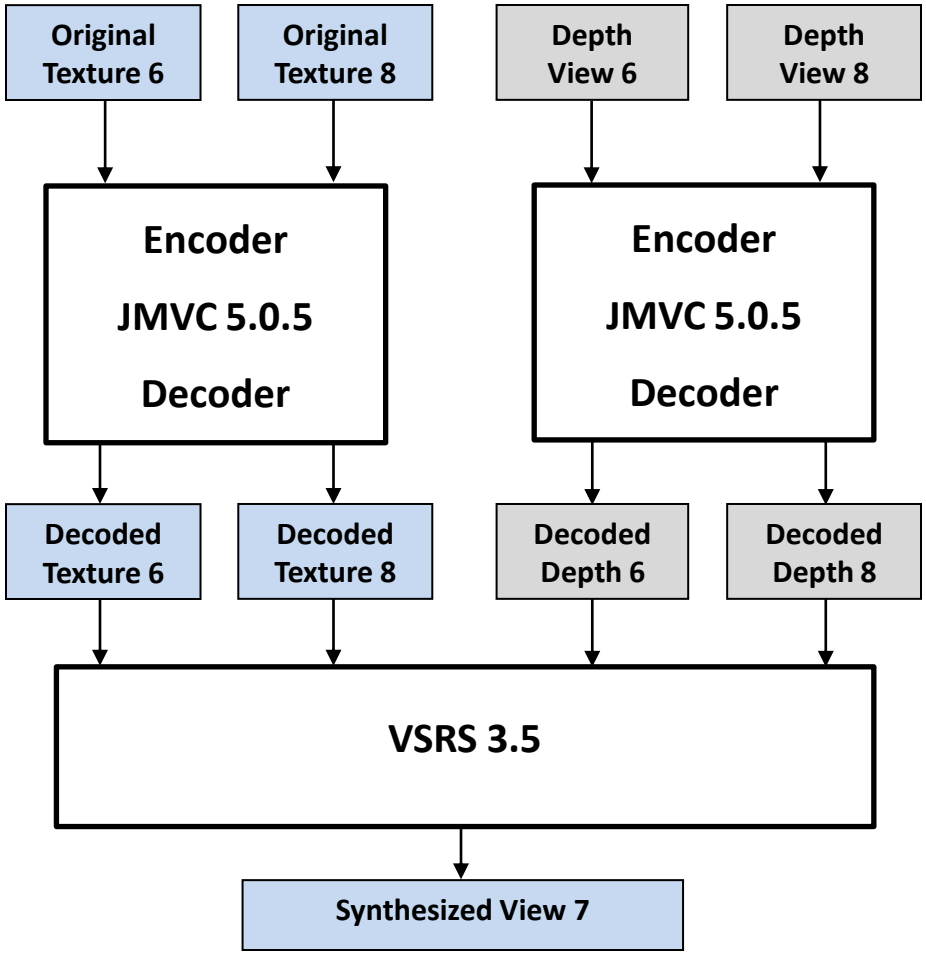
(a) Frame #01

(d)Frame #100

(C) Frame #150

(d)Frame #200

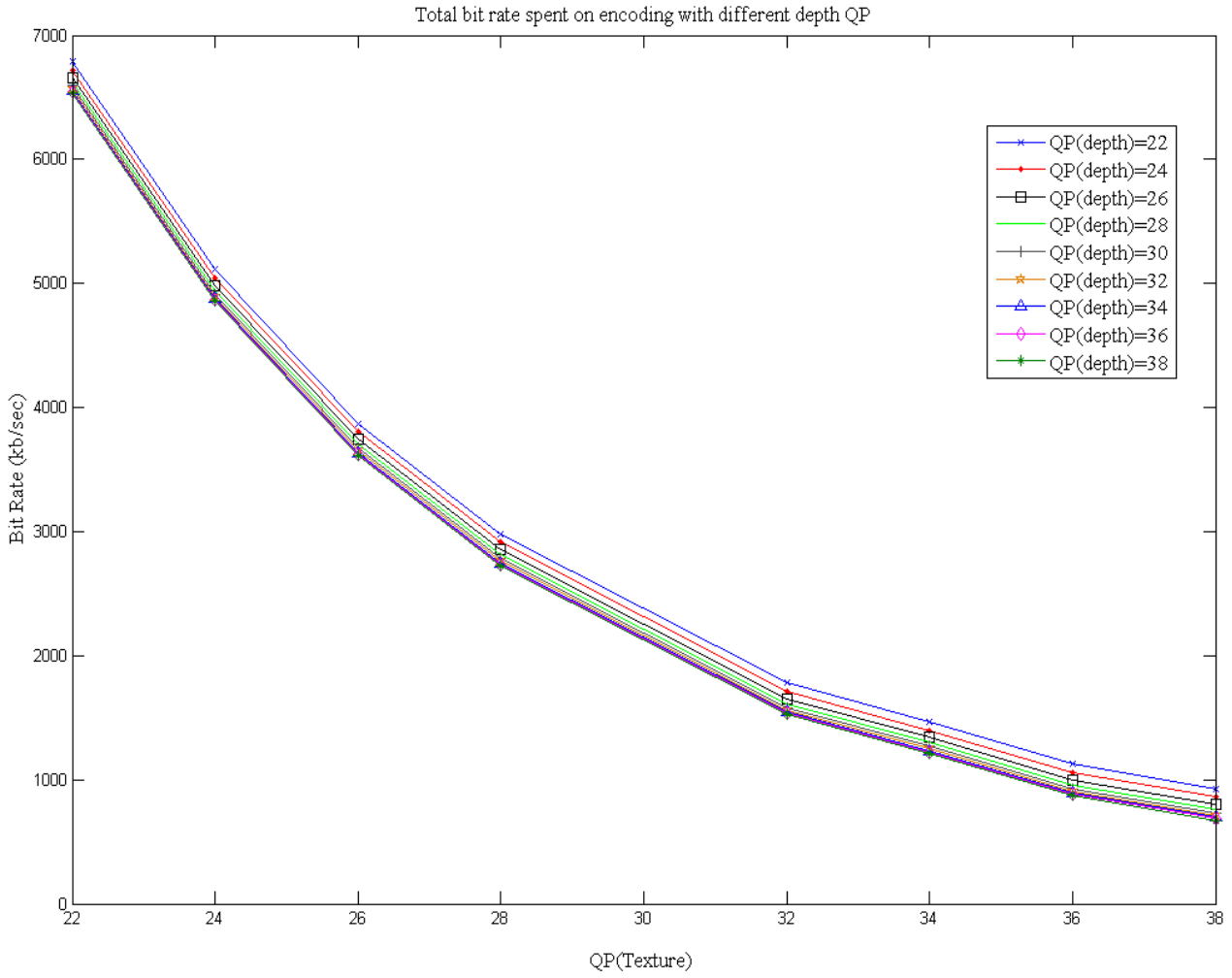
Exploration Experimental 4 Set Up



Coding Parameters

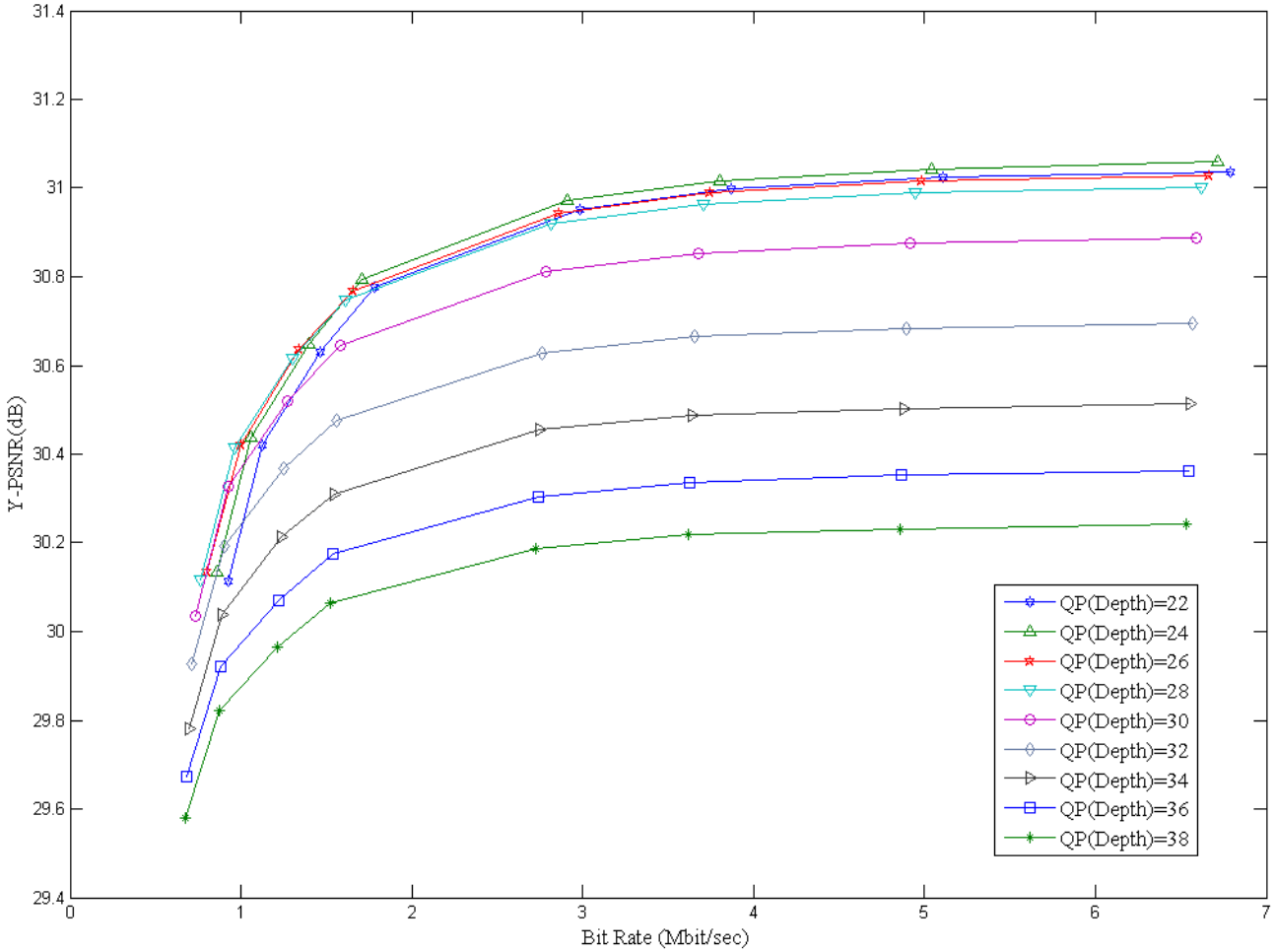
JMVC 5.0.5 Coding Parameter	
Quantization Parameter (Texture)	{22, 24, 26, 28, 32, 34, 36, 38}
Quantization Parameter (Depth)	{22, 24, 26, 28 , 30 , 32, 34, 36, 38}
Frames To Be Encoded	200
GOP Size	8
Intra Period	8
Inter Period Pics First	1
Search Mode	Fast Search
Search Range	96
View Scalability Information SEI	ON
View Order	0-2

EE4 Results



Total bit rate spent on encoding texture with different depth QP for views (6, 8)

EE4 Results



Quality of the synthesized view 7 vs. the total bit rate.
(when QP for depth map is fixed and QP for texture varies)

Synthesized Views

(Synthesized “lovebird1” view 7 using “decoded texture” and “decoded depth map”)

(a) Frame #01

(d)Frame #100

(C) Frame #150

(d)Frame #200

ETRI Process for PSNR

- **ETRI process for PSNR evaluation of the synthesized views:**

  (1) Encoding color and depth as a combination of QP using MVC.

  (2) Decoding the result of **process 1**.

  (3) Synthesize the virtual views using the result of **process 2**.

  (4) Synthesize the virtual views using unencoded original color and depth.

  (5) Evaluate PSNR on the results of **process 3** and **process 4**.

Conclusions

- EE1
  - Depth estimation by using a "*reference depth map*" (depth estimation mode "3") improves the quality of estimated depth map and hence the quality of the view synthesis.
- EE4
  - Quality of the synthesized view improves by assigning more bit rate to texture views.