

Supplementary Materials: Robust Spacecraft Component Detection in Point Clouds

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1 This is the supplementary for article *Robust Spacecraft Component Detection in Point Clouds*
2 submitted to *Sensors*.

3 This supplementary contains component detection results of robustness analysis of the proposed
4 detection scheme, details of which can be referred to the text of the article. Results for different point
5 distribution density (**20K**, **10K** and **05K**), position noise (**01U**, **02U** and **04U**) and direction noise (**05D**,
6 **10D** and **15D**) of all the 8 spacecraft (**cube**, **DSP**, **GPS**, **Helios**, **minisat**, **Radarsat**, **SCISAT** and **SPOT**)
7 with intermediate detection results are displayed in this supplementary. Definitions of notations for
8 distribution density and noise level, e.g., 50K, 04U and 15D, can be referred to text of the article.

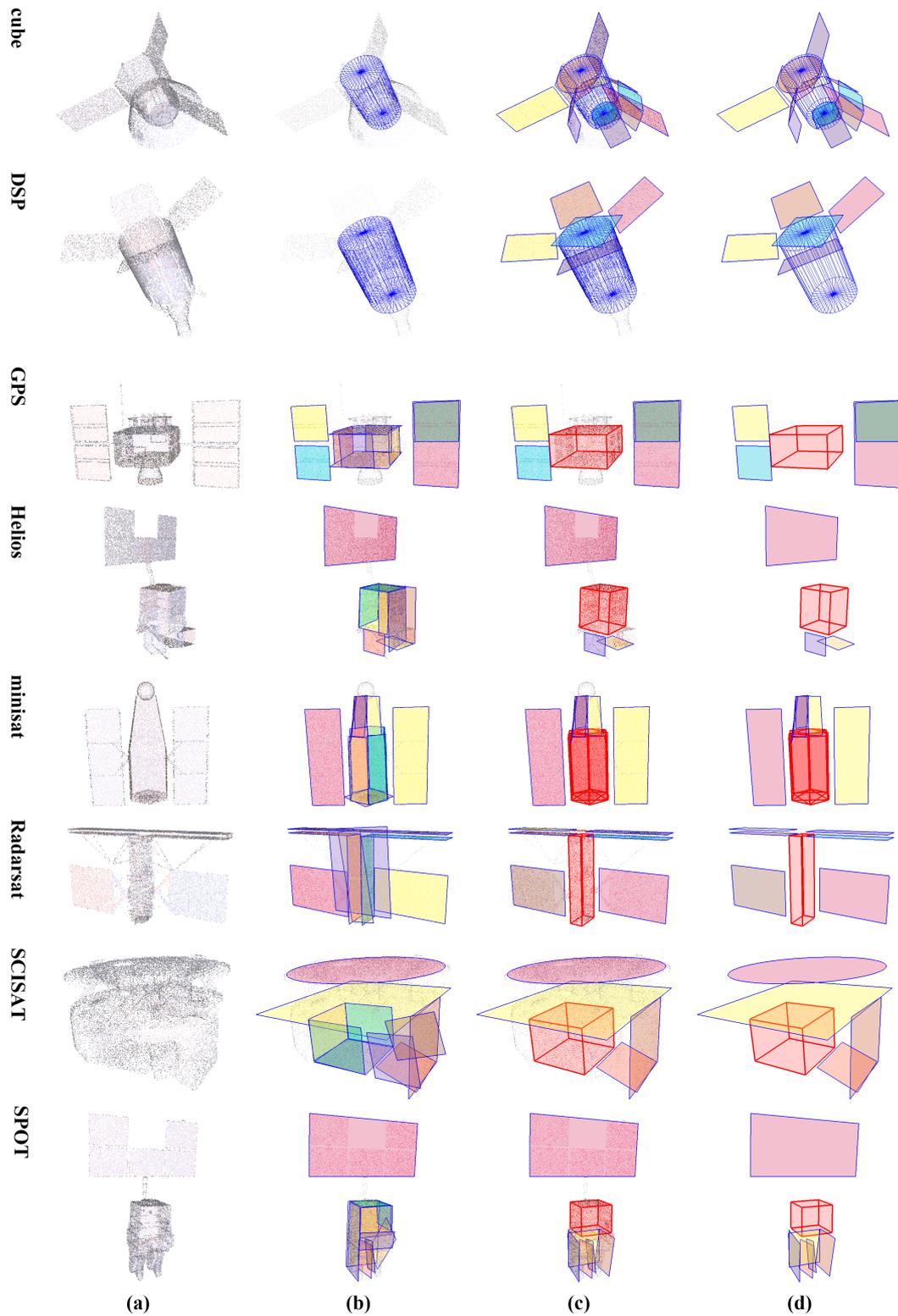


Figure S1. Detection results of the synthesized point cloud data 20K_00U_00D. From left to right: (a) the origin input point clouds; (b) results of cylinder detection or patch detection after detection of cylinders (the cylinders are rendered in blue, and patches are rendered in different colors.); (c) final results (the detected cuboids are rendered as red boxes.); (d) a clear view of the detected components.

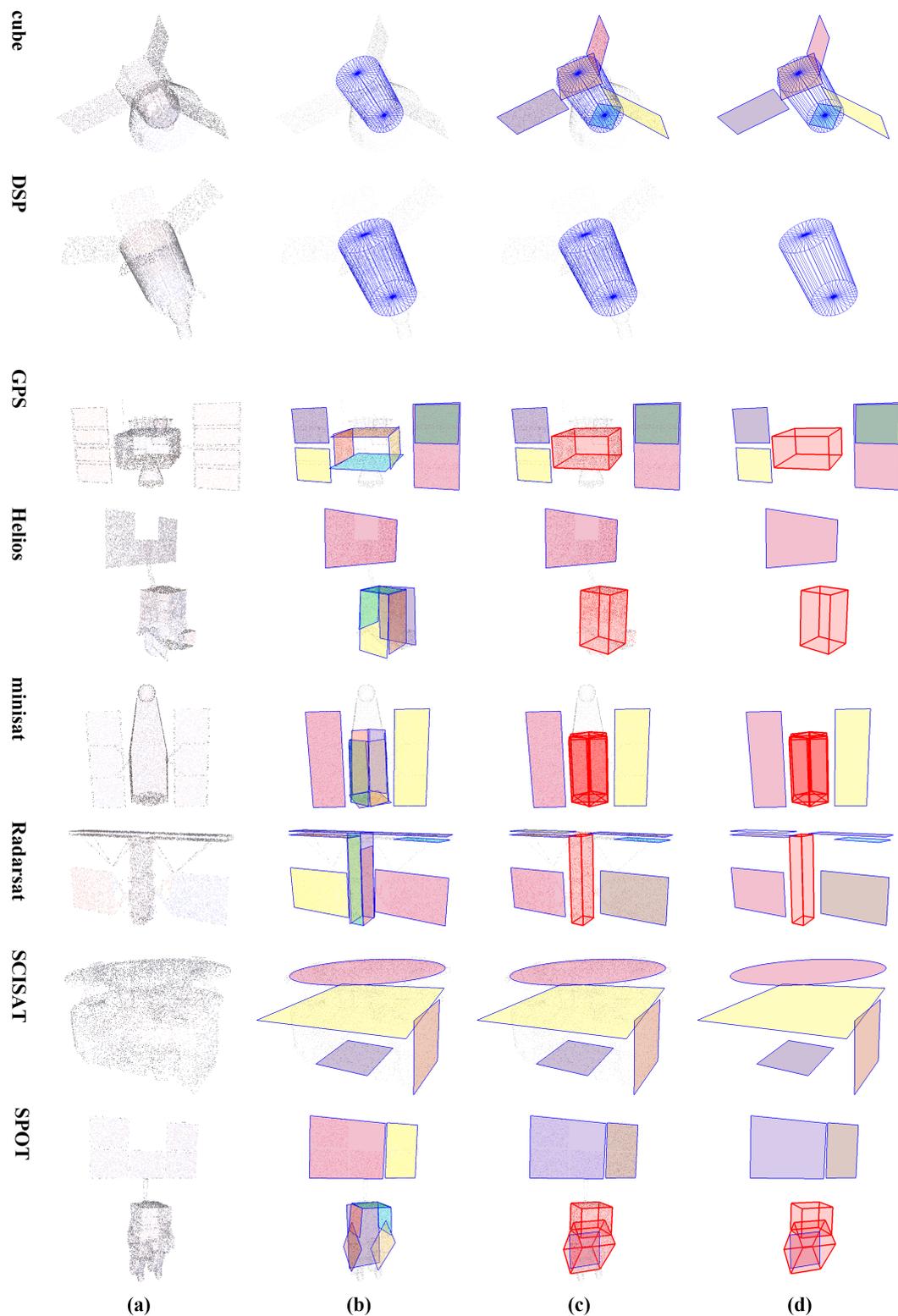


Figure S2. Detection results of the synthesized point cloud data *10K_00U_00D*. From left to right: (a) the origin input point clouds; (b) results of cylinder detection or patch detection after detection of cylinders (the cylinders are rendered in blue, and patches are rendered in different colors.); (c) final results (the detected cuboids are rendered as red boxes.); (d) a clear view of the detected components.

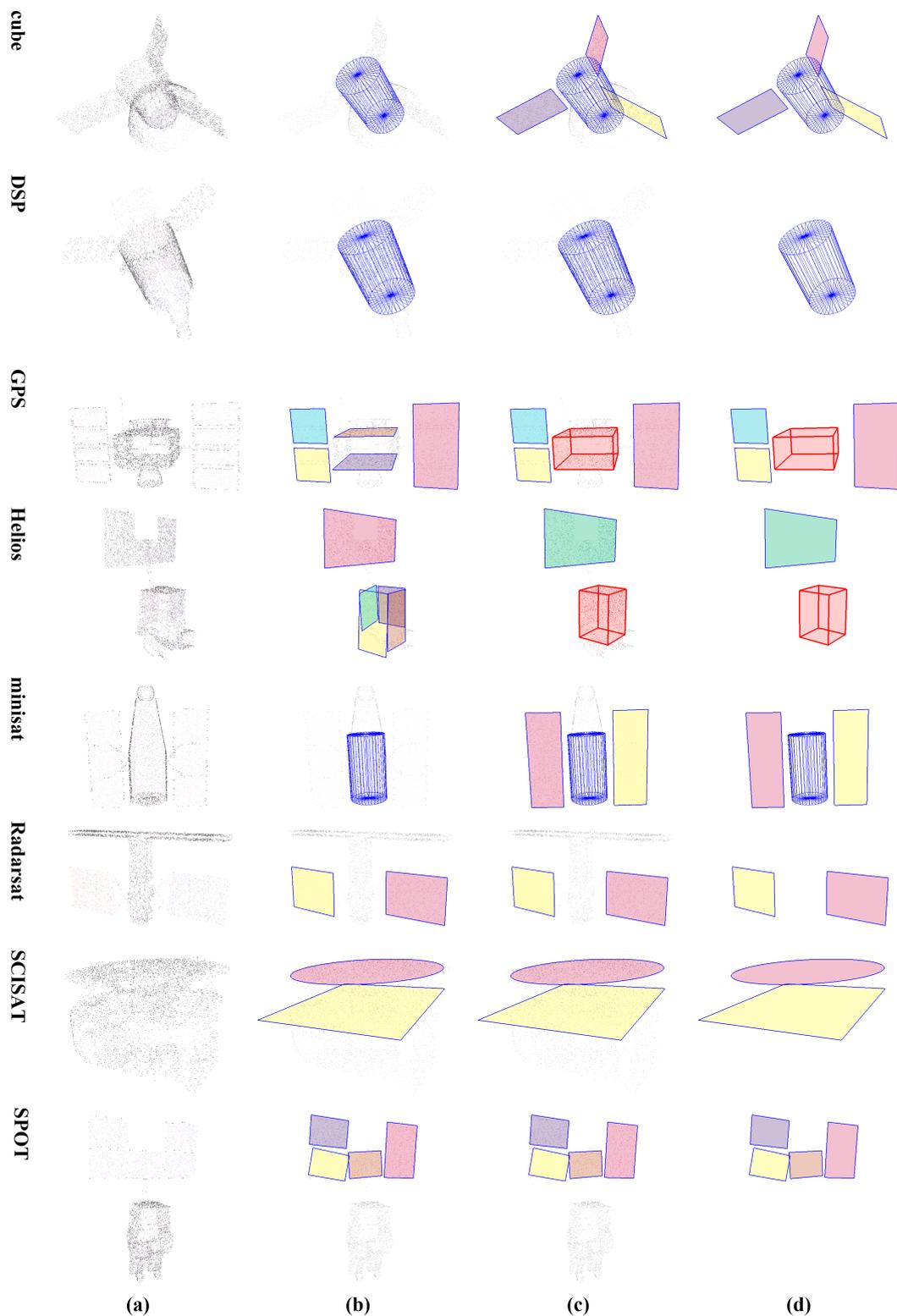


Figure S3. Detection results of the synthesized point cloud data *05K_00U_00D*. From left to right: (a) the origin input point clouds; (b) results of cylinder detection or patch detection after detection of cylinders (the cylinders are rendered in blue, and patches are rendered in different colors.); (c) final results (the detected cuboids are rendered as red boxes.); (d) a clear view of the detected components.

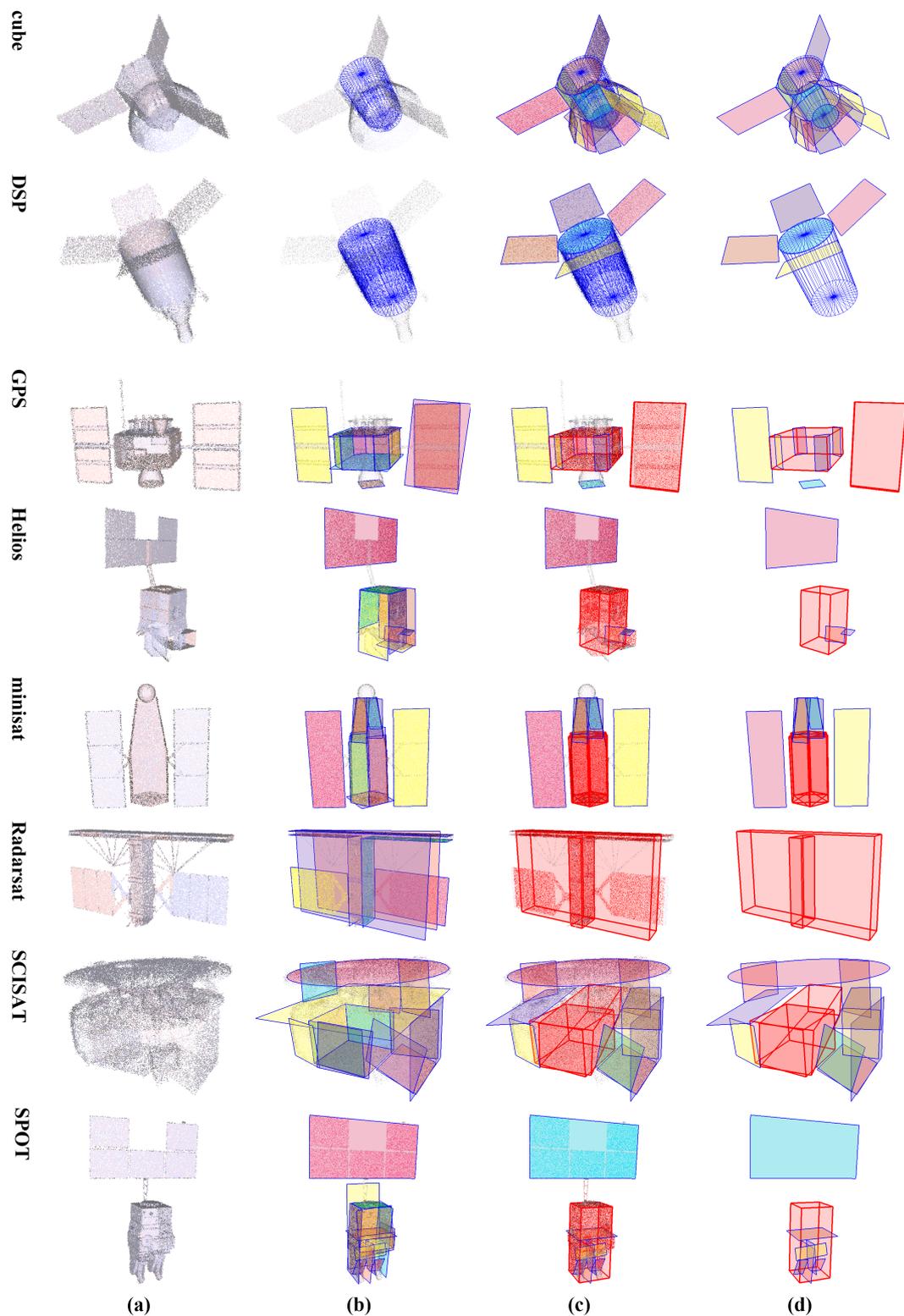


Figure S4. Detection results of the synthesized point cloud data *50K_01U_00D*. From left to right: (a) the origin input point clouds; (b) results of cylinder detection or patch detection after detection of cylinders (the cylinders are rendered in blue, and patches are rendered in different colors.); (c) final results (the detected cuboids are rendered as red boxes.); (d) a clear view of the detected components.

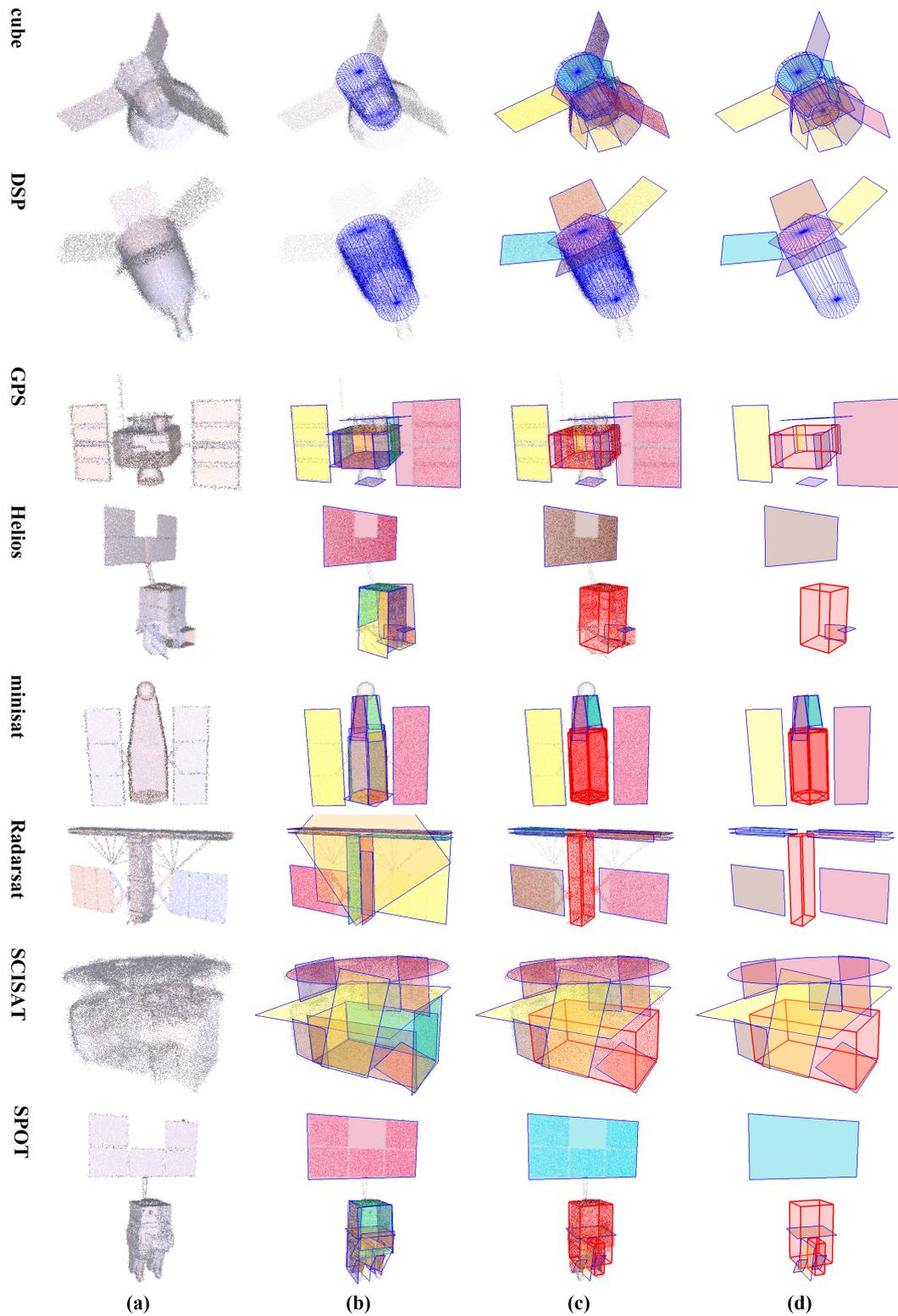


Figure S5. Detection results of the synthesized point cloud data *50K_02U_00D*. From left to right: (a) the origin input point clouds; (b) results of cylinder detection or patch detection after detection of cylinders (the cylinders are rendered in blue, and patches are rendered in different colors.); (c) final results (the detected cuboids are rendered as red boxes.); (d) a clear view of the detected components.

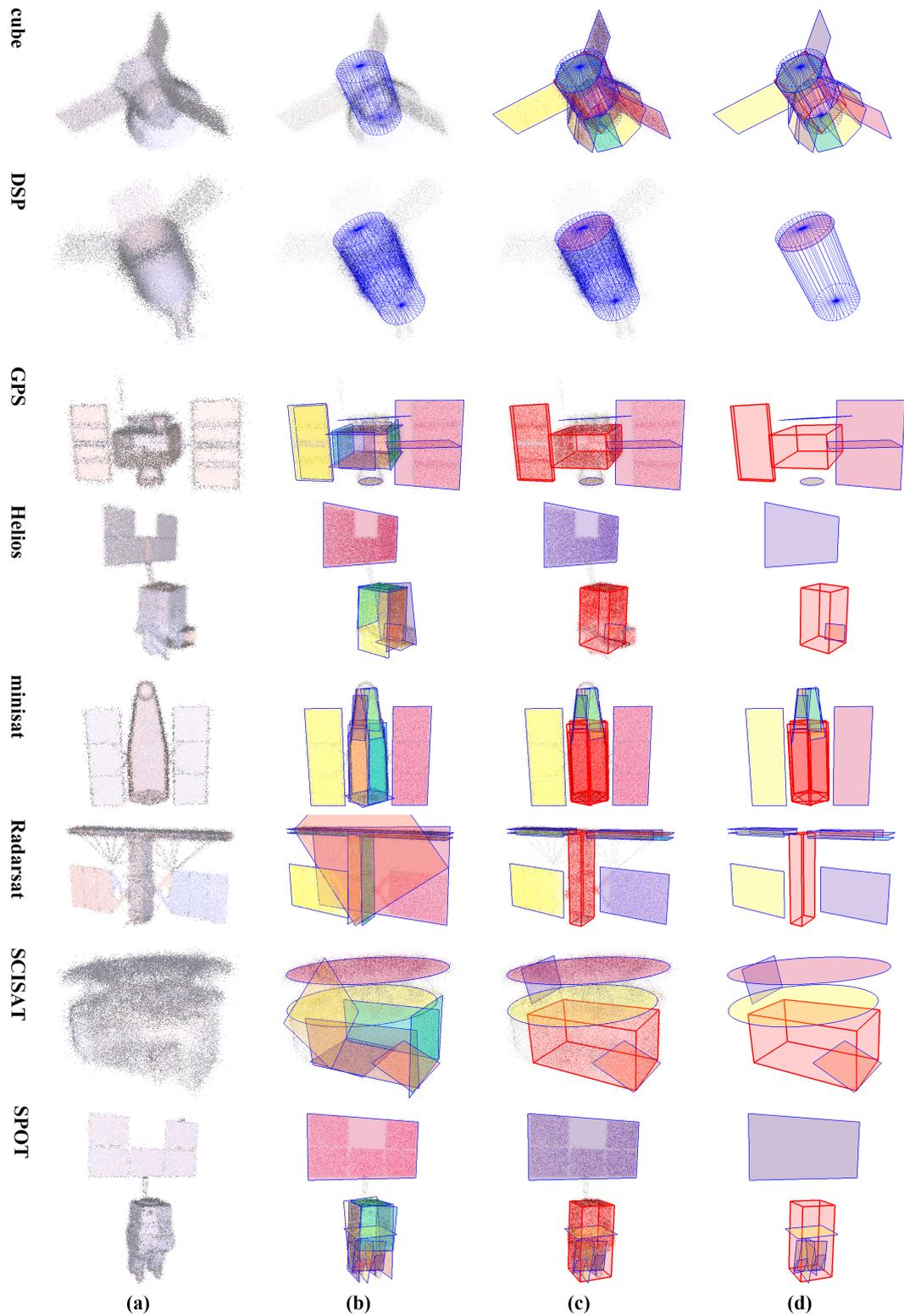


Figure S6. Detection results of the synthesized point cloud data *50K_04U_00D*. From left to right: (a) the origin input point clouds; (b) results of cylinder detection or patch detection after detection of cylinders (the cylinders are rendered in blue, and patches are rendered in different colors.); (c) final results (the detected cuboids are rendered as red boxes.); (d) a clear view of the detected components.

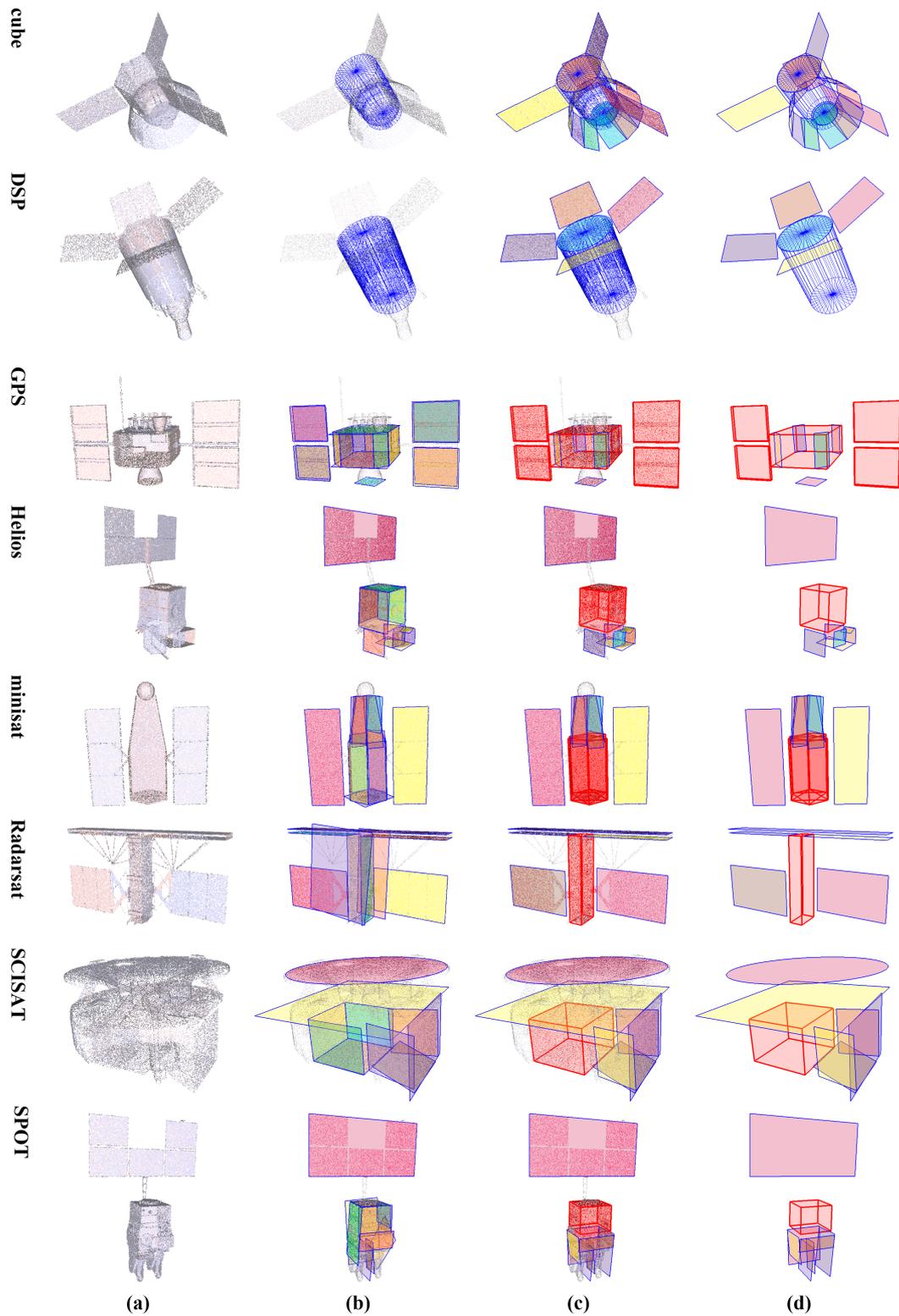


Figure S7. Detection results of the synthesized point cloud data *50K_00U_05D*. From left to right: (a) the origin input point clouds; (b) results of cylinder detection or patch detection after detection of cylinders (the cylinders are rendered in blue, and patches are rendered in different colors.); (c) final results (the detected cuboids are rendered as red boxes.); (d) a clear view of the detected components.

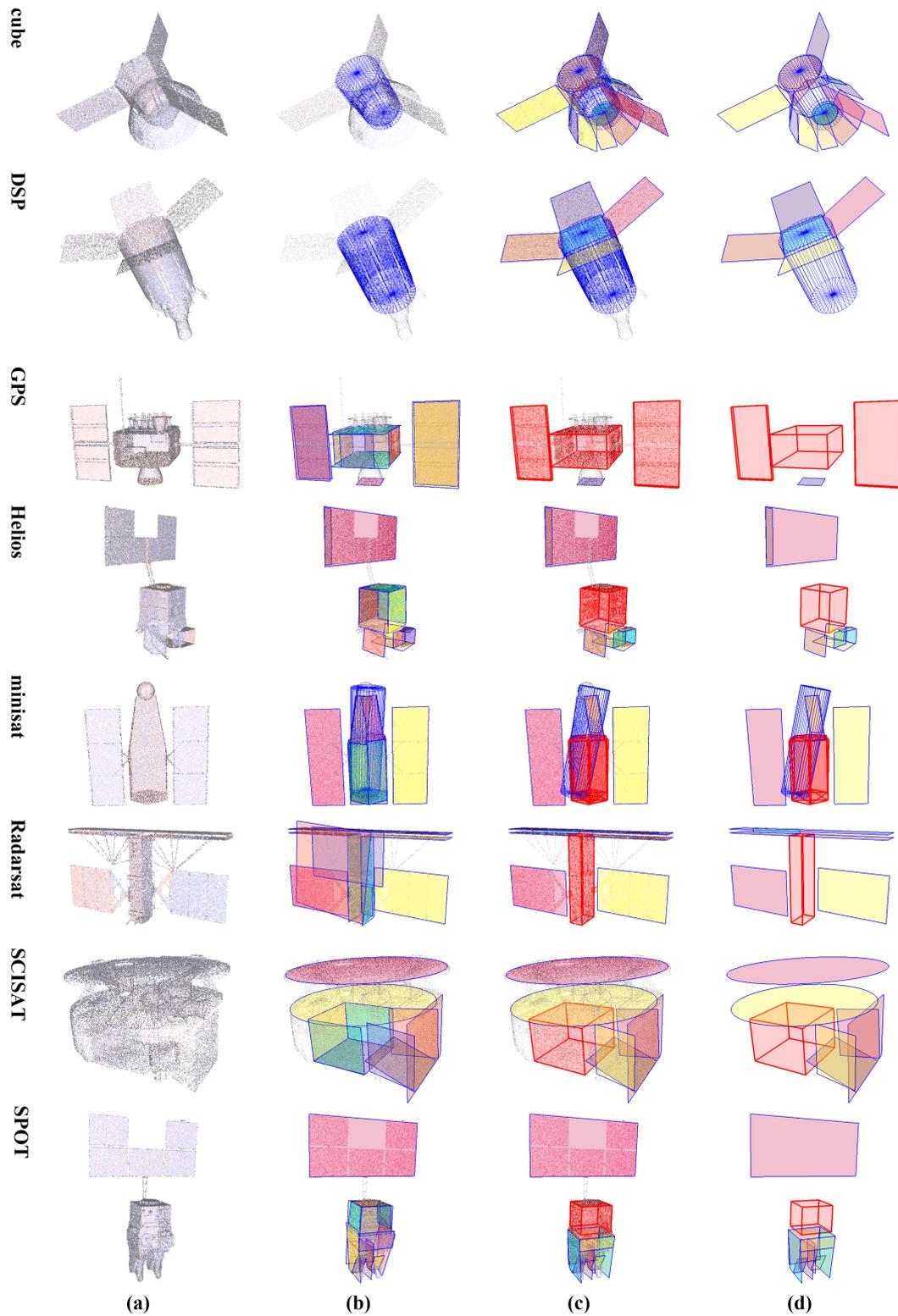


Figure S8. Detection results of the synthesized point cloud data *50K_00U_10D*. From left to right: (a) the origin input point clouds; (b) results of cylinder detection or patch detection after detection of cylinders (the cylinders are rendered in blue, and patches are rendered in different colors.); (c) final results (the detected cuboids are rendered as red boxes.); (d) a clear view of the detected components.

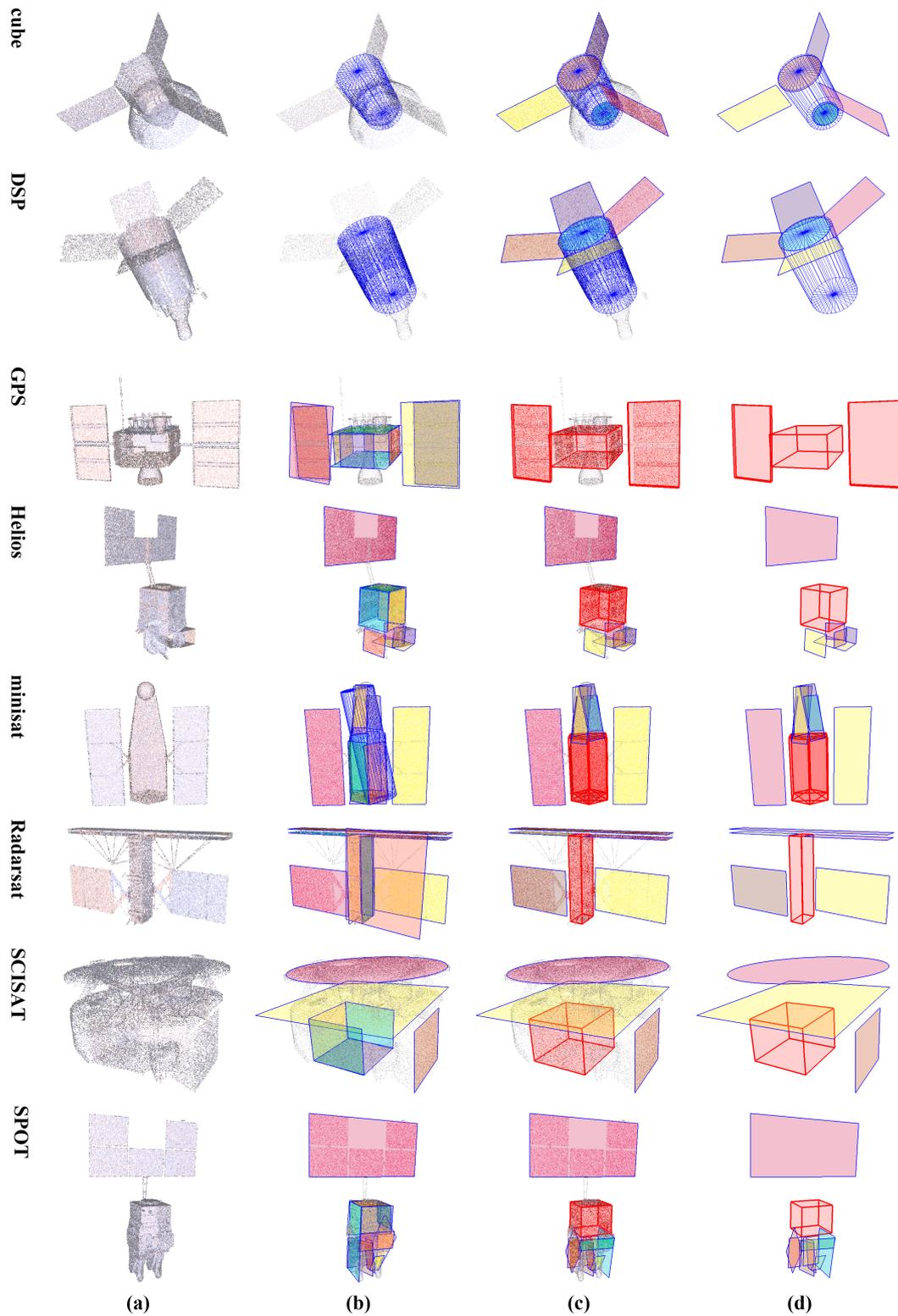


Figure S9. Detection results of the synthesized point cloud data *50K_00U_15D*. From left to right: (a) the origin input point clouds; (b) results of cylinder detection or patch detection after detection of cylinders (the cylinders are rendered in blue, and patches are rendered in different colors.); (c) final results (the detected cuboids are rendered as red boxes.); (d) a clear view of the detected components.