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Investigation of coherence in light harvesting proteins from cyanobacteria and cryptophytes with Free electron laser[1] RAIMUND FROMME, Arizona State University — Photosynthesis plays a crucial role in supporting life on Earth and regulating CO_2 levels. Therefore, comprehensive understanding of light absorption processes from light harvesting proteins involved in photosynthesis is of the greatest importance for mimicking these functions in human designed systems. In cyanobacteria, proteins of the phycobilisome, namely, phycocyanin (PC)[5] allophycocyanin (APC) and phycoerythrin(PE) harvest light and transfer the excitation energy to reaction centers where the charge separation takes place. The relatively new technique of serial femtosecond crystallography with free electron lasers (SFX) [1−4,7−8] allows for the first time to study the process of absorption and excitation energy transfer in the time zone of hundreds of femtoseconds to 100 pico seconds correlated with high resolution structures. [9] The development of new techniques of protein crystal delivery allows the use of down to 0.1 mg protein to get complete structural data with a resolution of up to 1.75 A resolution. [10−11]

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