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Ugur G Abdulla (abdulla@fit.edu) and **Evan Cosgrove*** (ecosgrove2011@my.fit.edu). *On the Optimal Control of the Multiphase Free Boundary Problems for Nonlinear Parabolic Equations*. Preliminary report.

We consider the inverse Stefan type multiphase free boundary problem, in which information on the boundary heat flux is missing, and must be found along with the temperature. We generalize the method developed in *Abdulla and Poggi, Applied Mathematics and Optimization, 2018* to pursue optimal control framework where control vector consists of the heat flux, and the cost functional is the L_2 -norm declination of the trace of temperature at the final moment of time to the measured data. We pursue discretization of the problem, and prove convergence of the discrete problem to the original problem with respect to both control and functional. (Received September 11, 2018)