(summary)

# Espresso extraction model

I’ve been thinking for a while about writing an espresso extraction model. After reading papers by Moroney and the recent paper by Hendon I finally have a good idea what I want to achieve.

So why am I so keen about the extraction model? Well, even a very simple model helps to establish a grid of reference and gain more insight. Remember when we talked about the puck resistance? Just by dividing the pressure by the flow we arrived at the quantity which was rather interesting to analyse.

An espresso extraction model predicts the soluble coffee mass changes in every part of the puck during the shot. Moroney’s, Hendon’s and this model uses the Fick’s first law of diffusion, which is a good approximation to describe the migration of the coffee mass between coffee “cells”. Also all three models treat the soluble coffee mass as some generic quantity. Basically what we measure with a refractometer is what we are going to model inside the puck. No complicated assumptions about the extraction of different coffee components under different pressure/temperature condition (for now!). This is our first line of reference. Will see if we can improve later.

The model can plot the Extraction Yield over the shot time, or remaining coffee mass in different parts of the puck, etc. Here is an example:

If you want to read the detailed description, this is on my GitHub, along with the C# source code (it works on Windows only at the moment): <https://github.com/AndyZap/EspMod/blob/master/doc/Model_doc.pdf>

I am happy to run the model for your shot files, just post them in this thread. The model need the *weight* from the Bluetooth scale, as well as the bean weight and the measured EY value. Also we need to make some assumptions about the Particle Size Distribution (unless you can measure it!).